

# Action Towards Healthy Eating...

Technical Report

Health and Welfare  
Canada

Santé et Bien-être social  
Canada

The Report of the  
Task and Technical  
Groups on Canada's  
Food Guide and the  
Task Group on Food  
Consumption

Canada



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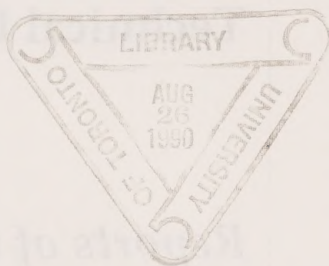
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# **Action Towards Healthy Eating. . .**

## **Technical Report**

*Reports of the Task  
Group and Technical  
Group on Canada's  
Food Guide and the  
Task Group on Food  
Consumption to the  
Communications/  
Implementation  
Committee*



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# Foreword

In 1987, Health and Welfare Canada initiated a review of the national nutrition guidelines and established two committees — the Scientific Review Committee and the Communications/Implementation Committee. The aim of these committees was to provide up-to-date nutrition recommendations for professionals and the public, which would promote and maintain health while reducing the risk of nutrition-related diseases.

The Scientific Review Committee (SRC) reviewed the scientific evidence from a public health perspective and revised the current Nutrition Recommendations, including the recommended nutrient intakes. The Report of the Scientific Review Committee, *Nutrition Recommendations*, presents the updated Nutrition Recommendations and their scientific rationale (see Appendix A for Executive Summary).

In accordance with its mandate, the Communications/Implementation Committee (CIC) translated the updated Nutrition Recommendations for the public and recommended ways to communicate and implement them in the Report of the Communications/Implementation Committee, entitled *Action Towards Healthy Eating* (see Appendix B for Executive Summary). In particular, the CIC was responsible for :

- reviewing *Canada's Food Guide* and analyzing the appropriateness and effectiveness in the Canadian setting of existing activities, methods and materials which communicate scientific findings as dietary advice (that is, nutrition and dietary guidelines);
- analyzing the updated nutrition recommendations in light of Canadian eating habits, food consumption and buying patterns and food production.

Two task groups and a technical advisory group were appointed to assist the CIC in carrying out its mandate: the Task Group on Canada's Food Guide, the Technical Group on Canada's Food

Guide and the Task Group on Food Consumption. All three reports are presented in this document, *Action Towards Healthy Eating — Technical Report*.

The first report is that of the Task Group on Canada's Food Guide. The Task Group was appointed to review *Canada's Food Guide*, the key nutrition education tool in Canada. It identified the need for the development of a food guidance system, based on a total diet approach, that takes account of the range of foods in the Canadian diet and addresses chronic disease prevention alongside the issue of nutritional adequacy.

Next is the report of the Technical Group on Canada's Food Guide. The Technical Group was formed to assess the practical implications of shifting from a foundation to a total diet approach for a food guide. It also examined the nutritional adequacy of the diet proposed in the Guide according to the revised Nutrition Recommendations.

The third report is from the Task Group on Food Consumption. This group was established to provide information on food consumption patterns and the distribution of nutrients in the Canadian food supply, to relate this information to the updated nutrition recommendations provided by the Scientific Review Committee, and to predict the impact of revised nutrition recommendations on the Canadian food supply and the development of new products.

Together, the recommendations of these three groups provide important advice for revisions to *Canada's Food Guide* and the implementation of Canada's Guidelines for Healthy Eating.



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# Report of the Task Group on Canada's Food Guide to the Communications/Implementation Committee

# Report of the Task Group on Canada's Food Guide to the Communications/Implementation Committee



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## Acknowledgement

**M**embers of the Task Group on *Canada's Food Guide* gratefully acknowledge the comments and suggestions of dietitians and nutritionists and other experts across Canada. Appreciation is also extended to Louise Beggs for the preparation of this report.



# 1.

## Executive Summary

This report is a working document of the Task Group on *Canada's Food Guide* in support of the work of the Communications/Implementation Committee, Health and Welfare Canada, for the review of Nutrition Recommendations for Canadians. Recommendations of the Task Group were submitted to the Communications/Implementation Committee to assist them in translating scientific statements into dietary advice for the public. The mandate and membership list of the Task Group are provided in Appendix I.

### Canada's Food Guide

*Canada's Food Guide*, initially known as *Canada's Official Food Rules*, was developed in 1942 and revised over the years to serve as a basis for nutrition education programs in all Canadian provinces and territories. It is a guide which visually depicts how consumers can meet nutrient needs by following a daily pattern of food selection.

### Review of Canada's Food Guide

*Canada's Food Guide* has been revised in both name and content over the years. The 1942 *Canada's Official Food Rules* were renamed *Canada's Food Rules* in 1944. In 1961, the publication became *Canada's Food Guide*. Major revisions to the content of the Guide were made in 1961, 1977 and 1982 to reflect advances in the knowledge of dietary requirements and nutrition education techniques, as well as changes in the Canadian food supply.

Since 1982, knowledge of dietary requirements has increased, and food consumption patterns continue to evolve in a changing marketplace. More is also known about chronic nutrition-related diseases, sparking interest in food in connection with specific chronic diseases, such as heart disease and cancer. Consequently, Health and Welfare Canada has undertaken to revise the

Nutrition Recommendations for Canadians. As key concepts of the latter are expressed in *Canada's Food Guide*, a review of the Guide was deemed essential to this task.

### Recommendations of the Task Group on Canada's Food Guide

The present *Canada's Food Guide* is an educational tool of great value to consumers and communicators of nutrition information. In reviewing the Guide, members of the Task Group decided that several features of the present Guide should be retained. These include:

- the food group classification system, in which foods are grouped by nutrient contribution and by consumer-acceptable commodity type;
- variety, as depicted by diversity in examples of foods within each food group;
- daily food selection recommendations; and
- the present method of distribution and copyright of the Guide by Health and Welfare Canada.

However, the Task Group also recommended changes to the Guide. Members of the Task Group on *Canada's Food Guide* submit the following recommendations, all of which are considered of equal importance, to the Communications/Implementation Committee.

### Recommendations related to the development of a food guidance system:

1. *Canada's Food Guide* should be based on a total diet approach that promotes dietary adequacy while integrating the most current Nutrition Recommendations.
2. The statement of purpose for *Canada's Food Guide* should read: "*Canada's Food Guide* is a realistic framework to assist healthy Canadians over two years of age in selecting foods to promote dietary adequacy."

3. *Canada's Food Guide* may be used:
    - for planning and selecting foods to promote health maintenance and risk reduction of chronic diet-related diseases among healthy Canadians over two years of age;
    - as a guideline or reference standard for legislation for institutional food services;
    - by individuals, to provide a general assessment only of their dietary intake; and
    - as an educational tool targeted to the needs of specific groups.
  4. To ensure widespread use of the food guide, foods contained in it should be readily accessible, affordable and acceptable to consumers. A variety of foods should be displayed within each food group to promote maximum acceptability of the Guide.
  5. A new title should be considered for *Canada's Food Guide*, in accordance with results of consumer research studies. The research should investigate desirability of retaining "Canada's Food Guide" as part of the title.
  6. *Canada's Food Guide* should retain a food group classification system that considers the current four food groups and emphasizes foods that best meet up-to-date nutrition recommendations. Consumer research should be done on the following:
    - What criteria should be used to classify foods in the Guide?
    - How valid is the Guide in suggesting food selections that promote dietary adequacy for each age and physiological group?
    - How can convenience foods, mixed foods and foods consumed away from home be classified in the Guide?
  7. Recommended serving sizes in the context of the total diet approach of *Canada's Food Guide* should be based on consumer dietary practices. The number of servings should be determined according to the Recommended Nutrient Intakes for Canadians and the revised Nutrition Recommendations. It may be necessary to modify serving sizes or numbers to meet the nutritional needs of some users. For example, serving sizes for children should be smaller while the number of recommended servings for pregnant and lactating women should be greater.
  8. *Canada's Food Guide* should continue to base its suggestions on a daily food intake. The Guide should contain a note stating that day-to-day variations in intakes are normal and not harmful.
  9. Foods in *Canada's Food Guide* should not be limited to those produced locally, in order to maintain the greatest possible variety within the Guide and to minimize unrealistic changes in dietary habits.
- Recommendations related to the implementation of a food guidance system:**
1. In order to determine an effective visual presentation for *Canada's Food Guide*, consumer research should be done and appropriate design and communication expertise sought. The design chosen should be simple, clear and adaptable and the text positive, straightforward and comprehensible.
  2. Health and Welfare Canada should continue to hold copyright for *Canada's Food Guide* and distribute it free of charge.
  3. *Canada's Food Guide* should serve as the core educational tool in a comprehensive food guidance system. It should be adaptable to specific target groups and supported by existing materials such as the Handbook (revised accordingly) as well as by new support materials.



4. A marketing and communication strategy should be developed to effectively relay *Canada's Food Guide* messages to consumers and communicators of nutrition information.

**Recommendation related to the evaluation of a food guidance system:**

1. Canada's food guidance system should be evaluated periodically (every five years or as necessary) among consumers and communicators of nutrition information, employing formative and summative evaluation methods.



## 2. Introduction

In 1987, Health and Welfare Canada assigned responsibility for the review and revision of the Nutrition Recommendations for Canadians to two committees. The Scientific Review Committee was charged with reviewing scientific evidence from a public health perspective in order to generate updated scientific statements as nutrition recommendations. The Communications/Implementation Committee assumed responsibility for translating the resulting scientific statements into dietary advice for the public and for recommending implementation strategies in order to promote health and reduce risk for nutrition-related diseases.

*Canada's Food Guide* is a major nutrition education tool which is widely used across the country. Since key concepts of the Nutrition Recommendations for Canadians are integrated into the Guide, their revision will affect the content of *Canada's Food Guide*.





### 3. Review Process

The Task Group on *Canada's Food Guide* was established by Health and Welfare Canada in July of 1988 to review *Canada's Food Guide*. This review was designed to support the work of the Communications/Implementation Committee to recommend methods of expressing updated Nutrition Recommendations. The Task Group consisted of experts in nutrition, nutrition education and communications from government and non-government organizations. The mandate and list of members of the Task Group are provided in Appendix I.

Members of the Task Group participated in three meetings and completed the following tasks:

- *Review of the Canadian and international literature on food guidance systems:*<sup>1</sup>

A review of the literature was prepared by one member of the Task Group, who was under contract to Health and Welfare Canada. References were collected through a computerized literature search, as well as from task group members and other experts. All members of the Task Group reviewed and responded to the document and participated in group discussions on issues related to a food guidance system.

- *Solicitation of contributions:*<sup>2</sup>

Expert and professional contributions on food guidance systems were sought from both formal and informal presentations to and contacts with individuals primarily in Canada but also from the United States.

- *Identification, analysis and categorization of issues:*

Issues related to a review of *Canada's Food Guide* and to recommendations on a food guidance system were identified by task group members from the literature review and from expert and professional contributions. These issues were then analyzed in group discussions and categorized as developmental, implementational and evaluational.

- *Development of recommendations to the Communications/Implementation Committee:*

Recommendations reflecting task group consensus on approaches to resolving the issues were developed and are presented to the Communications/Implementation Committee in this report.

Deliberations of the task group members were influenced by certain limitations. The review of the Nutrition Recommendations for Canadians was in progress during the mandate of the Task Group; therefore, updated nutrition recommendations were not available from the Scientific Review Committee at the time of deliberations.

As well, some data that the Task Group considered pertinent were limited or non-existent. Literature references on *Canada's Food Guide* were particularly scarce. This was especially true for evaluations of the Guide — only one national evaluation of *Canada's Food Guide* among Canadian consumers was documented. This evaluation focused solely on the comprehension of selected concepts of

1 A glossary of terms is presented in Appendix II.

2 A summary of these contributions is presented in Appendix III.

*Canada's Food Guide*. An extensive evaluation of *Canada's Food Guide* in terms of the nutrient adequacy of foods and quantities suggested was not available from the literature. Current food consumption data for Canadians are limited. The Task Group on Food Consumption, also reporting to the Communications/Implementation Committee, was in the process of preparing a summary of current knowledge of food consumption practices at the time of the deliberations of the Task Group on *Canada's Food Guide*, and the food consumption report was therefore not available.

## 4. Literature Review and Issue Identification

### Introduction

Food guides are graphic representations of recommended food selections which are designed to encourage a population to meet their nutrient requirements (Ballantyne and Bush, 1980). Ballantyne (1977) reported that food guides were being used in over 40 countries in the 1970s. The widespread use of food guides stemmed from the need to ensure adequate food intakes of healthy populations during times of food shortages, most notably during World War II (Hertzler and Anderson, 1974).

Canadians have been using a food guide since the 1940s. It was intended to meet five key criteria: acceptability to the Canadian public; comprehension by users; validity of nutrient requirements; appropriate design and presentation as well as flexibility for widespread use among Canadians (Health and Welfare Canada, 1979a). Traditionally, *Canada's Food Guide* has been targeted to three population segments: elementary and high school students; pregnant women and homemakers; and adults, particularly those who are overweight or who have a low income (Health and Welfare, 1979a).

Food guides and food guidance systems are being re-evaluated not only within Canada, but internationally as well. Canada's food guidance system uses *Canada's Food Guide*, which incorporates the Nutrition Recommendations for Canadians and is supported by a handbook for educators and an explanatory sheet for the public, as the main educational tool.

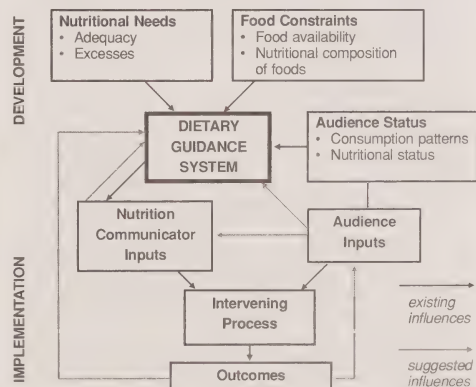
Gillespie (1985) has recommended that a food guide be systematically produced within the context of an extensive dietary guidance system. Based on a survey of nutrition professionals in the United States, Gillespie (1987) reported that although over half of the sample considered food groups to be effective teaching tools, 75% of

respondents suggested that a new food guidance system is necessary to meet the changing nutritional needs of the American population.

The following review of the literature is organized to reflect a model proposed by Gillespie (1985) for the development of a dietary guidance system (Figure 1). This model is the only one known to systematically describe how to develop such a system. As such, the first part of the review explores traditional considerations in the development of a food guide, that is, the nutritional status and needs of the population, food availability and consumption patterns. Since a food guide already exists in Canada, a brief historical perspective on its development is also presented. The second section of this chapter focuses on non-traditional considerations in the development process, such as contributions and comments from nutrition communicators and the audience. The final section highlights key issues which emerged from the literature.

Figure 1:

Framework for Developing and Implementing a Dietary Guidance System (Gillespie, 1985)



## Traditional Considerations

### Historical Perspective on Canada's Food Guide

*Canada's Food Guide* has an extensive history which spans more than four and a half decades. Over this time period, through the efforts of the Canadian Council on Nutrition, the Dominion Provincial Nutrition Committee, the Federal-Provincial Sub-committee on Nutrition and many nutrition-related professional organizations, the Food Guide has undergone numerous revisions. These changes were based on advances in the knowledge of dietary requirements; changes in food processing, storage and transportation methods; changes in eating habits and advances in nutrition education techniques.

#### Historical Development

The forerunner of the current food guide was designed by the Nutrition Division of the federal government in 1942 as *Canada's Official Food Rules*. This set of six statements was intended as a focal point for a wartime nutrition program to improve the health of Canadians by promoting better eating habits (Pett, 1942; Canadian Council on Nutrition, 1943; Anon, 1961; Moirell, 1963; Ballantyne, 1977). The publication identified five food groups in which specific amounts of foods such as milk, fruit, vegetables, cereals and breads, meat, fish and eggs were suggested for daily consumption. Limited supplies of certain foods, such as milk, prompted the Canadian Council on Nutrition (1943) to base the Food Rules on 70% of the dietary standard.

In 1944, the Canadian Council on Nutrition approved *Canada's Food Rules* and deleted the term "official" from the title. At this time, the Rules were based on a "fully adequate figure", not 70% of the dietary standard (Canadian Council on Nutrition, 1944). Numerous changes to the content of the publication were made. In order to meet riboflavin requirements, the Rules advocated the consumption of a greater quantity of milk. However, the scarcity of milk that was evident at the time prompted the Department of Agriculture to object to this recommendation. The term "substitute" was replaced by "alternate"

in the meat group to guard against misinterpretation. Limited supplies of kidney and heart prompted the mention of these meats to be deleted from the meat group; however, due to "distinct nutritional characteristics", liver was retained in the examples of foods (Anon, 1944). Cheese and eggs were incorporated into the meat group on the basis of their protein content. Butter was mentioned in the breads and cereals group. A statement recommending the consumption of water and iodized salt was added to underline their importance in the Canadian diet (Canadian Council on Nutrition, 1944 and 1945).

In 1949, the Ontario Interdepartmental Committee made a suggestion to revise *Canada's Food Rules* to the Dominion Provincial Nutrition Committee which was later accepted by the Canadian Council on Nutrition. The quantity of milk advocated for children was decreased and a milk consumption recommendation for adolescents was introduced, since clarification of requirements for younger and older children had been requested by numerous doctors and nutritionists (Pett, 1949). Reference to "Canada Approved Bread" was replaced by the descriptive phrase "Rich in vitamin B". The term "frequently" replaced the term "weekly" in relation to liver consumption, and greater emphasis was placed on eggs and cheese. As surveys indicated that 37 to 91% of Canadian children consumed no vitamin D (Pett, 1948), a recommendation for this nutrient was stated more explicitly.

A 1949 regulation stipulating that salt for table or household use had to contain 0.01% potassium iodide prompted the recommendation for iodized salt to be deleted from the Food Rules (Canadian Council on Nutrition, 1950).

The feasibility of using a four food group system was first explored in 1959. Combining fruits and vegetables into one group was considered nutritionally justifiable. In addition, it would avoid classification problems with foods such as tomatoes, permit a more attractive format and, to some extent, simplify teaching. This proposed change was rejected in 1960 on the basis of the following: potential for confusion among users; a need for emphasis on vegetables as a distinct group in many parts of Canada; the ease of teaching menu-planning with five groups; and the



need to distinguish from the American four food group system (Dominion Provincial Nutrition Committee, 1960). At this time, the name was changed to *Canada's Food Guide* to reflect the flexibility with which Canadians could apply the advice. Changes in terminology were also incorporated — “cups” and “ounces” replaced “pints”; “citrus fruit” was clarified by examples; and the phrase “at least” was deleted (Canadian Council on Nutrition, 1960 and 1961).

Major revisions in 1977 were stimulated by an evaluation of food habits and nutrient intake in 1966 and results of the Nutrition Canada Survey in 1973 (McClinton et al., 1971; Health and Welfare Canada, 1977a). The 1966 study was significant, since it revealed that *Canada's Food Guide* did not reflect eating patterns in Canada. The study called for the development of a pattern of eating that would reflect actual food use more accurately. Among the changes proposed were: greater flexibility; four food groups; examples of serving sizes; emphasis on variety; and the development of a teaching manual.

A number of professional organizations such as the Canadian Dietetic Association, the Canadian Dental Association, the Canadian Medical Association, the Canadian Home Economics Association and the Canadian Public Health Association, along with many interested individuals, contributed to the 1977 revision (Ballantyne, 1977). A four food group system was presented in a circular design with graphic presentation of foods. Over thirty changes were made in the text. There were more examples of serving sizes and foods and the numbers and sizes of servings were more flexible, which in turn put a greater emphasis on variety, a key principle of the Food Guide. A milestone in nutrition education was marked by the development of the accompanying *Canada's Food Guide Handbook* for nutrition educators to ensure consistency in the interpretation of the Guide. The Handbook presented information on the food groups as well as suggestions for using the Food Guide in different settings (Ballantyne, 1977; Health and Welfare Canada 1977b).

An evaluation of the 1977 *Canada's Food Guide* and its Handbook prompted further revisions to both of these materials in 1982. The Nutrition

Recommendations for Canadians (Murray and Rae, 1979), which had been promoted since 1977, led to the presentation of three major concepts in the Guide: *variety* in food choices and eating patterns; *moderation* in the consumption of fat, sugar, salt and alcohol; and *balance* between energy intake and energy expenditure. The objective of *Canada's Food Guide* was stated in the Handbook as the following: “to provide a framework to assist the majority of Canadians in choosing foods which satisfy their recommended daily nutrient intakes” (Health and Welfare Canada, 1982). Changes in the text included more extensive use of SI units, consistent with the adoption of the metric system, more relevant examples of serving sizes and the modification of the names of two food groups: Breads and Cereals; and Meat, Fish, Poultry and Alternates. The Handbook was re-written to be consistent with these changes and was expanded to include a chapter on nutrition education concepts as well as more information on using *Canada's Food Guide* during different stages of the lifecycle. A single sheet, entitled “Using *Canada's Food Guide* to Eat Better and Feel Great”, was also developed to assist the public in using the Guide.

#### Evaluation

Formal evaluations of *Canada's Food Rules and Guide* have been few in number. In 1964, a field evaluation of a folder entitled “Good Eating with *Canada's Food Guide*” was conducted by the federal government. Responses indicated that Canadians found it very useful, clear, concise and helpful in monitoring and improving food habits (Dominion Provincial Nutrition Committee, 1965).

The 1966 study of food habits and nutrient intakes, which was cited previously, contributed to the evaluation of *Canada's Food Guide* (McClinton et al., 1971). Because it was found that the Guide did not reflect actual Canadian eating patterns, subsequent major revisions were made, and *Canada's Food Guide Handbook* was developed.

A nationwide evaluation of the Guide and its handbook by nutrition professionals and paraprofessionals in 1979 indicated wide acceptance and use of both of these materials in health and related programs across the country (Health and Welfare Canada, 1979a). Respondents



stated that the Guide and Handbook were useful in teaching nutrition to a wide variety of clients; however, they advocated the integration of the Nutrition Recommendations for Canadians and minor modifications to the texts of both materials. No evaluation of this type was conducted among consumers.

##### *Distribution*

*Canada's Food Guide* and Handbook are copyright materials of Health and Welfare Canada. From 1977 and 1988, over one million copies of the Guide, and more than 125 000 copies of the Handbook, were distributed yearly in both official languages by the federal government through a joint distribution system with the provinces. Primary users of these materials are those working in the health and education systems. Requests are continually received from organizations, industry, academics, publishers and authors for permission to reproduce or adapt the Guide or excerpts from the Handbook for inclusion in a variety of publications, ranging from education materials to cookbooks. In 1988, due to a change in fiscal policy, the Handbook became a costed item, available through the Department of Supply and Services Canada. However, the Guide continues to be distributed free of charge by Health and Welfare Canada.

##### **Nutritional Status and Needs of Canadians**

There has been no national nutrition survey in Canada since the Nutrition Canada Survey in the 1970s. It is therefore difficult to assess, on a national basis, whether the nutritional intakes and nutritional status of Canadians have changed appreciably in the years following that survey.

*Canada's Food Guide* was developed, and later revised in 1961 and 1977, to address nutrients which the Canadian diet appeared to be lacking, based on the results of the Nutrition Canada Survey. In this category were calcium, iron,

vitamin A, thiamine and folacin (Health and Welfare Canada, 1973). Meeting the recommended intakes for these nutrients has been a challenge in the United States as well (Light and Cronin, 1981; Cronin et al., 1987).

Overweight and obesity were identified in the Nutrition Canada Survey as problems for the Canadian population which resulted from overconsumption. These problems continue to exist for a large number of Canadians. According to the Canada Health Promotion Survey, 47.7% of Canadian women and 37.1% of Canadian men were classified as "obese" according to the Body Mass Index ( $\text{Weight}[\text{kg}]/[\text{Height}(\text{m})]^2$ ) method of assessing weight (Health and Welfare Canada, 1988). However, this survey also indicated that underweight is becoming more prevalent as a health problem, especially among young women (Woolcott, 1985).

##### **Food Availability**

Reports on the present availability of food in Canada and how availability relates to food consumption were not found in the literature. However, several authors have described the greater complexity of the food market that is the result of the increasing numbers and types of food products available (Molitor, 1980; McNutt, 1986; Sloan, 1987).

##### **Food Consumption Patterns**

Two important questions relate to current food consumption practices. The first is whether or not Canadians consume foods differently now than they did in 1982, which was the date of the last revision to *Canada's Food Guide*. The second question is whether or not Canadians purchase foods based on the classification system outlined in the Guide.

*What recent changes have occurred in food consumption patterns?*

A large-scale survey of actual food consumption practices in Canada over the last 10 to 15 years was not available.<sup>3</sup> Actual food consumption practices can, however, be inferred from disappearance and expenditure data. Thirty percent of the Canadian food dollar was being spent on meals away from home in 1985, whereas only 22% of the food dollar served this function in 1969 (Davey, 1987). This change was attributed to a combination of economic, demographic and lifestyle changes, including increased numbers of working women, higher real incomes and smaller families. As well, overall expenditure has increased for cereal products, fish, fats and oils, fresh vegetables and frozen foods. On the other hand, expenditures have declined on dairy products, eggs, meat and canned fruits and vegetables.

Stewart and Robbins (1986) reported greater disappearance of chicken, cheese, partly skimmed milk, yogurt, vegetables and fats since 1974. The same data suggest decreasing consumption of red meats, eggs, whole milk and animal fats. Thus, current food practices of Canadians appear to be generally consistent with the 1977 Nutrition Recommendations for Canadians.

Several studies in Canada have asked respondents if they had made dietary changes in the recent past. From the reported intakes of those surveyed, it appears that a good number of Canadians feel they have.

The Grocery Products Manufacturers of Canada (GPMC) survey of 1979, which was intended to describe food purchasing behaviours of a small sample of Canadians, found that of 406 mothers across Canada, 46% of English-speaking respondents and 41% of French-speaking respondents claimed that they had made dietary changes (Grocery Products Manufacturers of

Canada, 1979). Two major changes were a decrease in meat consumption and an increase in the consumption of fruits. Rae and Nielsen (1980) surveyed 2014 adults, 40% of whom reported having changed their eating habits in the last year. Most respondents said these changes involved decreasing their intake of sweets and sugar. In 1982, Woolcott asked 153 rural and 113 urban Ontario women if they had changed their food intake in the last two years (Woolcott, 1982). Two thirds of the sample reported decreasing sweets and sugar, and over half said they had increased their consumption of vegetables. In a recent GPMC survey (1988), which included some questions on dietary habits, the majority of respondents (54% of women, 46% of men) reported that they had made dietary changes in the last year. This rate represents a slight increase from that revealed in the 1979 survey.

It appears that Canadians feel they are making changes in their diets. The role of *Canada's Food Guide* in motivating these changes is not known. In the 1988 GPMC survey, respondents who reported making changes said they did so because of nutritional concerns. Of these, 90% reported reading food labels, while 49% reported using *Canada's Food Guide* as a reference in making these changes.

Despite the finding of Rae and Nielsen (1980) that consumers changed their dietary intakes due to concerns related to their weight or their desire to feel better, several other authors have identified factors such as price (Grocery Products Manufacturers of Canada, 1979) and food preference (Birch, 1979; Forster-Coull and Sabry, 1986). In the Health Promotion Survey (1987), only eight percent of the sample reported a desire to change their food habits. Of these, 62% said that barriers such as lack of time and money prevented them from making desired dietary changes.

3 Recent trends in Canadian food consumption practices were explored by the Task Group on Food Consumption, which reported to the Communications/Implementation Committee, Health and Welfare Canada.

Cleveland and Pfeffer (1987) examined the factor of cost in terms of adopting the recommendations put forth in the United States Department of Agriculture food guide and recent recommendations from cancer organizations. A diet which recognizes both basic food guide suggestions as well as more general cancer-prevention recommendations was found to be more costly for the consumer. Thus, cost is a potential obstacle to consumers who wish to follow a revised food guide in which recommendations are included.

Therefore, when nutritional concerns guide the desire to change food habits, *Canada's Food Guide* may be one reference used by Canadians. However, other factors, such as cost and food preference, appear to play a role in whether or not consumers actually use *Canada's Food Guide* to change their food habits.

#### *Do Canadians use a food group classification system when making food purchases?*

No study could be found to describe whether or not Canadians purchase foods on the basis of the food guide classification system, nor on how Canadians actually classify foods. Based on American literature, it would appear that consumers do not classify foods on the basis of nutrients, even though food guides do. Schutz et al. (1975) reported that sociologists and anthropologists have observed that foods can be classified into five different groups: cultural super-foods; prestige foods; body-image foods; sympathetic magic foods and physiologic foods.

Among army personnel, Schutz et al. (1975) also found foods were classified into five different groups: high-calorie treat foods; specialty meat items; common meal items; refreshing healthy foods and inexpensive filling foods. More recently, Axelson et al. (1986) tested 51 college students to see how they grouped foods. Again, this group did not consider nutrient content. Instead, they identified three classes of foods: convenience foods, good/bad foods and animal/plant foods. Nutrition educators at the Ontario Milk Marketing Board have observed however, that

some users of *Canada's Food Guide* do indeed classify foods based on their nutrient content (Horgen, personal communication, 1988).

It would appear that people do classify foods into groups, though nutrients contained in them may not always be a factor.

## Non-traditional Considerations

### Audience Input

An important factor in designing a food guidance system is audience input (Gillespie, 1985). Factors affecting audience input include awareness of existing food guidance materials and their content, and the audience's use of, knowledge about and attitude toward these materials.

### Awareness of the Guide

The Canadian literature suggests a trend towards increasing awareness of *Canada's Food Guide*. In the 1979 GPMC survey, over 50% of respondents were not aware of government nutrition publications, of which *Canada's Food Guide* is one (Grocery Products Manufacturers of Canada, 1979). In the Nutrition Concepts Evaluation Study done by Health and Welfare Canada in 1979, researchers found that "the public seems to be aware of Canada Food Guide content". Results however, may not represent the situation on a national scale, since this survey did not include samples from either Quebec or the Northwest Territories.

Woolcott (1982) found that 67% of rural Ontario women had heard of *Canada's Food Guide*, as had 62% of urban women. This rate is comparable to the results of the 1988 GPMC survey, in which 68% of the sample reported having referred to the Guide in the past: 38% had done so in the previous year (Grocery Products Manufacturers of Canada, 1988). Thus, moderate to high levels of awareness of the Guide were reported in the Canadian literature reviewed (Woolcott, 1985; Woolcott et al., 1987). Awareness is generally higher among women, who are still the main food shopper in most households (Grocery Products Manufacturers of Canada, 1988). Despite general high awareness, authors have questioned the



public's understanding of the Guide (Woolcott, 1985) as well as the public's image of the Guide (Ackhurst and Massey, personal communication, 1987).

#### *Awareness of the Guide's Concepts*

Results of the Nutrition Concepts Evaluation Study (Health and Welfare Canada, 1979b) suggested that some general nutrition concepts advocated in *Canada's Food Guide*, such as eating a balanced meal, were understood by Canadians. However, details on nutrition information were considered less important than were general concepts. Woolcott (1985) also found that among the sample of respondents, most could name general ideas contained in the Guide, with few being able to recall specific concepts.

In the Nutrition Concepts Evaluation Study (1979), the term "sensible" to describe healthy eating habits consistent with *Canada's Food Guide* seemed more meaningful to respondents than did the term "balanced". By comparison, in the recent study by Woolcott et al. (1987), the term "balanced" was understood better by consumers in Toronto. Terminology and specific words used to express the educational messages in *Canada's Food Guide* may not be universally understood or accepted. As well, it remains to be determined whether or not Canadians apply these concepts to their food practices.

#### *Use, Knowledge and Attitudes Among Consumers*

An underlying principle supporting the design of *Canada's Food Guide* is that it be understood by the Canadian public (Health and Welfare Canada, 1979a).

In their review of the results of the Nutrition Concepts Evaluation Study, Krebs-Smith et al. (1987) were concerned that although Canadians may have heard of the Guide, their comprehension of some of its key concepts, for example dietary variety, may be very limited.

Allard and Mongeon (1982) tested Quebec college students on their ability to recall the names of the four food groups and to identify foods containing vitamin C. The overall knowledge score was very low, with a mean of 48.3%. Female students

tended to achieve higher scores and to express more positive attitudes toward the Guide. Woolcott (1985) found that most of the women in the sample were familiar with the Nutrition Recommendations for Canadians as outlined in *Canada's Food Guide Handbook*.

The fact that Canadians may have a general understanding of food guide concepts was suggested in the Health Foods Survey (Health and Welfare Canada, 1987). Of 4500 respondents from five metropolitan cities in Canada, the majority appeared to know that "foods recommended for a healthy diet are those advocated by *Canada's Food Guide*".

The degree of understanding of *Canada's Food Guide* among children appears to depend on their level of development (Ackhurst and Massey, personal communication, 1987). Nutrition educators at the B.C. Dairy Foundation suggest that the principles in *Canada's Food Guide* can only be fully understood and applied by children in grades four or five and up. The Canada Health Knowledge Survey Summary Report may confirm this (Anon, 1980). School-aged children in Canada were tested on their ability to apply *Canada's Food Guide* in evaluating the quality of a meal. Less than half of children in grade four were able to do so. Again, girls tended to do slightly better in this task than boys. Since school-aged children are primary targets for *Canada's Food Guide*, it is necessary to ensure that it is suited to this segment of the Canadian population.

However, nutrition educators at the Ontario Milk Marketing Board feel that teaching the principles of *Canada's Food Guide* to young children is still a valuable and valid practice, since the principles of the Guide serve as a foundation for nutrition instruction. As long as the teaching methods and educational content are tailored to their level, children gain from being exposed to *Canada's Food Guide*, even at an early age (Horgen, personal communication, 1988).

The degree to which the Guide is actually understood by consumers is difficult to measure. Even so, the extent to which the Guide is used may reflect its value to communicators of nutrition education such as nutrition professionals, teachers and nurses — a total of

over one million French and English copies of *Canada's Food Guide* are distributed annually by Health and Welfare Canada (Palin, personal communication, 1988).

In the Nutrition Concepts Evaluation Study, less than one in 20 respondents reported saying that *Canada's Food Guide* was an important source of information for them (Health and Welfare Canada, 1979b). By comparison, schools were perceived as important sources of nutrition information by one third of the sample. In fact, schools are also primary targets for the Guide (Health and Welfare Canada, 1979a). One in four of the respondents had heard of, seen or read *Canada's Food Guide* (Health and Welfare Canada, 1979b). More women than men were likely to say they felt the Guide was useful.

Potential remains for Canadians to make even greater use of the Guide. Some reasons for the less than optimal use of the Guide have been suggested in the literature. For one thing, Canadian consumers tend to be passive in their search for nutrition information — easily accessible sources such as magazines, newspapers and food labels may be more widely read than other forms of information (Woolcott, 1985; Woolcott, 1987; Grocery Products Manufacturers of Canada, 1988). The way in which the Guide is presented in Canada may also influence the public's image of the Guide and, consequently, their response to it.

In general, Canadians appear to have a positive attitude toward nutrition, as evidenced in the 1988 GPMC survey which found that eating a nutritionally balanced meal ranked second in importance — after checking product prices — in a list of general shopping issues (Grocery Products Manufacturers of Canada, 1988). Positive attitudes toward *Canada's Food Guide* seem particularly prevalent among Canadian women.

##### *Predisposition of the Audience*

The audience for *Canada's Food Guide* can be characterized by general, biodemographic and environmental factors. Each is essential in understanding the needs of Canadians in relation to a food guidance system.

##### General Characteristics

Nutrition itself was considered either very or extremely important by the majority of adult Canadian consumers questioned in the GPMC survey (Grocery Products Manufacturers of Canada, 1988). Canadian and American nutrition professionals suggested that since basic principles of nutrition seem to be generally well accepted, consumers need more detailed information on nutrition specifics, such as energy, fat and sugar (Fremes and Sabry, 1976; McNutt, 1986). In a survey of Ontario women, two main areas of concern identified were food ingredients (such as sugar, salt, cholesterol, fat, additives and caffeine) and weight control (Woolcott, 1985). In the Health Foods Survey, over 90% of respondents were concerned about food additives (Health and Welfare Canada, 1980). More recently, Woolcott (1987) listed the main nutritional concerns of Canadians as those related to weight control, general health and nutrition benefits, specific nutrients, other ingredients and food safety. The fact that Canadians appear concerned about more specific nutrition-related information is consistent with the changing profile of the Canadian consumer and the expanding complexity of the food environment in which he or she must function (Molitor, 1980).

##### Biodemographic Characteristics

Davey (1987) described the changing profile of the Canadian consumer. Canadians are no longer reproducing at a rate sufficient to replace themselves; the population as a whole is aging rapidly; on average, Canadians are becoming better educated and more women are working, factors which are changing the composition and size of the Canadian work force. However, despite an average trend toward higher levels of education, functional illiteracy continues to be prevalent in Canada. The Southam Literacy Survey found that 24% of Canadian residents 18 years of age and older were functionally illiterate (Calamai, 1987). Illiteracy is highest among men, low-income Canadians and people living in Eastern Canada. Although Canadians have specific characteristics as a group, the population actually consists of non-homogeneous subgroups with different abilities and needs.

### Environmental Characteristics

The Canadian food market has expanded both in the number and kinds of food products available. Davey (1987) reported that Canadians are bombarded with a plethora of nutrition information on a daily basis. Even so, the GPMC survey of 1988 found that the majority of consumers surveyed still wished to learn more about the topic (Grocery Products Manufacturers of Canada, 1988).

Canadians have become increasingly aware of fitness in relation to health, and their behaviour is beginning to reflect this fact (Davey, 1987). A trend for "lean and fresh" food is becoming increasingly evident (Davey, 1987; Grocery Products Manufacturers of Canada, 1988). As a result, the food industry is changing to meet new demands for package sizes, energy value and convenience.

Woolcott (1985) has identified three main types of factors in the Canadian environment which influence the food-related practices of consumers: socio-cultural, technological, economic and agricultural factors; food production and distribution factors; and community and family factors. No study could be found in the Canadian literature which addressed the relationship of these factors to dietary behaviour (Woolcott, 1985). However, parents and family members as well as schools have been cited by nearly one third of Canadians as important sources of nutrition information (Health and Welfare Canada, 1979b). Studies in the United States have identified family structure, size and stage in the lifecycle as influential factors as well (Woolcott, 1985).

As profiles of both the Canadian consumer and the food market change, *Canada's Food Guide* must be adapted to the evolving needs of consumers and to recognize current food practices.

### Nutrition Communicators' Input

#### *Food Guides in Canada*

In order to explore nutrition communicators' input on food guides in Canada and in other countries, the discussion below is organized under three headings: the issue of validity, general issues and suggestions for a food guidance system.

#### The Issue of Validity

One concern to nutrition communicators is the underlying validity of a food guide in both Canada and the U.S. (McClinton et al., 1971; King et al., 1978; Hausman, 1979; Ballantyne and Bush, 1980; Misskey, 1987). Validity of a food guide is defined as its ability to translate numerical nutrient recommendations into realistic food servings (Hertzler and Anderson, 1974; Health and Welfare Canada, 1979a). Along with the challenge of validity are five other assumptions that underlie the translation process: that the guide be modifiable for individual needs; that it be achievable; that it recognize that any dietary change does not occur in isolation; that the message be positive in tone; and that it encourage supportive interpretation among users (Guthrie, 1987).

As mentioned, validity is a key concept underlying the design of *Canada's Food Guide* (Health and Welfare Canada, 1979a). However, few studies have explored whether or not an individual following *Canada's Food Guide* can be assured of meeting his or her recommended nutrient intakes. Prior to the 1977 revision to the Guide and its Handbook, McClinton et al. (1971) suggested changes in the number of servings in *Canada's Food Guide* that would ensure adequate calcium and iron intakes, continue to provide recommended intakes of other nutrients and incorporate realistic amounts of foods. From food records of 4529 persons aged seven to 60 years and over, these researchers found that only 31.3% of the sample met their recommended intakes for eight key nutrients: protein, calcium, iron, vitamin A, thiamine, riboflavin, niacin and vitamin C. Of those with satisfactory nutrient intakes, only 78% met the minimum number of suggested servings in *Canada's Food Guide*. Only 10% of those with unsatisfactory nutrient intakes met the minimum suggestions of the Guide. The discrepancy



between recommended nutrient intakes and food guide suggestions concerned the authors, who consequently concluded that baseline intakes for all four food groups should be raised. It also became obvious to the authors that *Canada's Food Guide* did not describe the food habits of the majority of their sample, since only 34% of those having adequate nutrient intakes consumed the recommended number of food group servings.

The ability of Canadians to meet their recommended intake for iron by following *Canada's Food Guide* was also addressed prior to the 1977 revision of the Guide. Haresign (1976) determined that suggestions from the Guide did allow adequate iron intakes for men and women over the age of 50. However, iron requirements for adult women and adolescents, especially girls, were the least well-met. Several recommendations were made: increase energy intake, since a high correlation has been reported between caloric intake and iron intake, although the practicality of this recommendation was questioned by the author; and increase government enrichment of breads and cereals with iron and/or recommend iron supplements for specific segments of the Canadian population.

In a more recent study of food intakes relative to the serving sizes recommended in *Canada's Food Guide*, Misskey (1987) reported that most children in the Saskatchewan study did not consume the suggested number of milk and milk products servings. From recalled intakes provided by 54 mothers, it was found that up to one quarter of three-year-old children consumed fewer servings of milk and milk products than recommended. Though this study did not compare food intake to nutrient intake, nor comment on calcium status per se, the Nutrition Canada Survey (Health and Welfare Canada, 1973) revealed that 17% of young children in Saskatchewan had inadequate or marginal dietary calcium intakes.

The question of the validity of serving sizes for young children in *Canada's Food Guide* has also been raised (Brown, 1988). In order to recognize

differences in serving sizes for pre-schoolers and adults, the Ontario Milk Marketing Board (1980) developed a "Preschool Nutrition Guide" using "child-size servings". Concepts from *Canada's Food Guide* formed the basis of the new guide, with serving sizes and numbers modified to reflect children's needs.

Nutrition educators in Ontario have tested several programs based on *Canada's Food Guide* among school-aged children. Cooper and Philip (1974) reported on the success of such a nutrition program among third-graders. They noted improved nutrition knowledge and attitude scores as well as self-reported dietary changes among learners as a result of the program. Project Apex, piloted in 1987 and developed jointly by the Ontario Milk Marketing Board, PARTICIPaction and the Ontario Physical Health Education Association, was also based on *Canada's Food Guide* and designed for children 9 to 11 years of age. It resulted in increased attitude and knowledge scores, especially among fourth and fifth graders.

Therefore, results of a limited number of validity studies in Canada suggest that *Canada's Food Guide* may not describe actual food practices. In addition, it may not meet recommended intakes for all nutrients. However, *Canada's Food Guide* is based on a foundation diet approach and is therefore not designed to meet 100% of the recommended nutrient intakes (Health and Welfare Canada, 1982). By increasing their energy intake, Canadians might also increase their nutrient intakes and, in so doing, would be more likely to meet their recommended nutrient intakes. Similarly, the American Basic Four<sup>4</sup> was designed to provide approximately 1200 kcal of energy and 80% or more of the eight nutrients which had recommended dietary allowances in 1953 (Light and Cronin, 1981).

Despite the fact that few studies have tested the actual validity of *Canada's Food Guide*, two reports in the literature comment on how valid nutrition professionals perceive the Guide to be. In the

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4 "Food for Fitness — A Daily Food Guide"

evaluation of *Canada's Food Guide* and Handbook, 19% of the sample of nutrition professionals and paraprofessionals were concerned that *Canada's Food Guide* did not ensure nutrient adequacy (Health and Welfare Canada, 1979a). This concern was especially prevalent among university, public health and government nutritionists. Ballantyne and Bush (1980) reported that the majority of nutrition professionals surveyed in the evaluation of *Canada's Food Guide* and Handbook did not identify any one nutrient as "at risk" based on the Guide. Forty-nine percent of the sample also suggested that a food guide should reflect the latest Nutrition Recommendations for Canadians in order to be most useful for the Canadian public. At present, the Nutrition Recommendations for Canadians are stated in *Canada's Food Guide Handbook* and are summarized on the tearsheet.

Despite some concern by approximately one in five nutrition professionals in Canada regarding the validity of *Canada's Food Guide*, the majority perceive the Guide as valid. A systematic evaluation of the validity of the Guide in providing adequate nutrient intakes has yet to be done.

#### General Issues

The evaluation of *Canada's Food Guide* and Handbook identified several important criteria in the development of a food guide (Health and Welfare Canada, 1979a). Some of these are: flexibility, reflection of the Recommended Nutrient Intakes, widespread use, uniformity, and key concepts, such as variety and energy balance.

At the time of the study, *Canada's Food Guide* was being widely used: over 90% of the sample of nutrition professionals reported using it. A small percentage of respondents did not feel the Guide was useful for preschoolers (6.3%) or for overweight adults (2.3%). Most felt *Canada's Food Guide* could potentially have a greater impact with elementary and high-school students.

Only 68% of the sample of professionals responded correctly to a statement on the concept of variety as described in the Guide. Krebs-Smith et al. (1987) recommended that the message of variety requires further promotion and

clarification. These researchers suggested that dietary adequacy is best defined by variety among, rather than within, groups.

Another issue raised in the literature is that of serving sizes. Using USDA Nationwide Food Consumption Survey data, Krebs-Smith and Smiciklas-Wright (1985) found that existing serving sizes did not reflect the actual sizes of food servings used by consumers. In general, serving sizes used by consumers were greater than those recommended in the USDA food guide for fruits and breads and cereals, and smaller than recommended for vegetables and meats and alternatives. In view of these findings, the authors recommended that serving sizes be practical and based upon actual sizes used by consumers.

*Canada's Food Guide* is presently illustrated by a circle, which was chosen to reflect the unique contribution made by each of the four food groups to total dietary intake (Health and Welfare Canada, 1982). The design promotes the concept of unity such that the four food groups together constitute the diet. Results of the evaluation of *Canada's Food Guide* and Handbook suggested that, in 1979, this graphic design was acceptable to 79% of nutrition professionals and paraprofessionals surveyed (Health and Welfare Canada, 1979a). However, 9% of respondents did not like it. The present two-sided presentation made little difference to respondents, with 42% saying it was an improvement to a one-sided sheet and 39% finding it made no difference. Most respondents suggested, however, that actual photographs on the Guide would be more appealing. Only one third of respondents used the colour codes for each of the four food groups.

Overall satisfaction with the physical circle layout and other characteristics of the Guide was high, although some ideas for future revision were advanced. Andersen (1977) proposed that a food pyramid offers a visual advantage to the food circle. The pyramid, in which foods would be grouped into three levels, could be used to express relative food consumption recommendations. It is also simpler in design.

Modified forms of the Guide have been produced by Health and Welfare Canada to meet the specific needs of Native peoples in the interior of

British Columbia and in the Northwest Territories. Quebec has published a "Quebec Food Guide" which does not compare food groups, but rather highlights concepts of healthy eating (Affaires sociales Québec, 1980). Quebec also has its own nutrition policy (1977), which outlines general rules for good dietary habits. Some of these include the concept of variety, the importance of a good breakfast and the reduction of salt and fat in the diet.

Sustainable agriculture has become a concern (Gussow and Clancy, 1986; Tomasik, personal communication, 1988). In Ontario, the Renfrew County and District Health Unit has produced a publication entitled "Renfrew County's Food Guide" which emphasizes the consumption of local produce (Jones, personal communication, 1988). The "Renfrew County's Food Guide" also illustrates, using a rainbow design, relative frequencies of food consumption.

Saskatchewan Health, of the government of Saskatchewan, has also developed its own food guide based on *Canada's Food Guide* (Cooper, personal communication, 1988). This guide is part of an activity program entitled "Take it from the Top", which is designed for nurses teaching prenatal nutrition classes. Distinctive features of the Saskatchewan guide include: food groups that are different from those in *Canada's Food Guide*; a fan-shaped design to suggest other foods than those shown may also belong within certain groups; and recommended levels of food intake within the food groups.

Meal-planning publications for diabetics and for vegetarians have used food group systems in Canada. The "Vegetarian Meal-Planning Guide" modifies the food groups of *Canada's Food Guide* to suit the needs of vegetarians (Smith, 1980). The Canadian Diabetes Association's "Good Health Eating Guide" is based on food groupings, although these differ slightly from those in *Canada's Food Guide* (Canadian Diabetes Association, 1980).

It would therefore appear that, over all, food groupings are widely used by educators in Canada. It might be advantageous to consider continuing with such an approach, though factors such as the circle design versus that of a pyramid

or a modified circle may merit further study, as would issues such as acceptability, understanding and use of a food guide classification system by consumers.

#### Suggestions for a Food Guidance System

Recommendations from the Nutrition Concepts Evaluation Study (Health and Welfare Canada, 1979b) and the *Canada's Food Guide* and Handbook evaluation (Health and Welfare Canada, 1979a) provide overall support among nutrition professionals for continued use of a food guide system in Canada. (This is strengthened by more recent comments received from the nutrition community in Canada, which are presented in Appendix III.)

While the literature supports continued use of a food guide system based on food groups, several authors have suggested fine-tuning the Guide. Fremes and Sabry (1976) argued that the fruits and vegetables group should be separated, since these foods are used differently by consumers and excessive intakes of one do not compensate for inadequate intakes of the other.

In 1971, McClinton et al. stressed the need to promote the concept of the relationships between food nutrients and health. This idea has been echoed more recently by both Bright-See et al. (1986) and Krebs-Smith et al. (1987). The latter suggest that foods within groups be placed in some order of priority relative to health. Foods higher in fat, for instance, would be recommended for less frequent consumption. Bright-See et al. (1986) have developed a fibre-exchange system which uses bar graphs as well as an inverted pyramid to reflect recommended frequency of consumption of foods, based on fibre and fat content. Lawrence (1984) sub-grouped *Canada's Food Guide* food groups as "core members" for frequent consumption, "fringe foods" for less frequent consumption and "non-members" for rare consumption. (Specific suggestions for modifying *Canada's Food Guide* have also been provided by nutritionists, dietetic associations and organizations and are presented in Appendix III.)



Therefore, it appears that acceptance of a food group system in Canada is high, though some modifications to the Guide have been recommended. Frequently mentioned is the desire to further promote the concept of relationships among foods and their recommended frequency of consumption. In addition, continued use of such a system will nevertheless involve its delivery being targeted to segments of the Canadian population, while reducing barriers to its use (Woolcott, 1987).

#### *Food Guides in Other Countries*

Food guides in other countries are discussed under three headings: the issue of validity, general issues and suggestions for a food guidance system.

#### *The Issue of Validity*

Nutrition communicators in the United States have been actively exploring the validity of their food guide system and have expressed concern over the appropriateness of the system for the American population.

Early work by King et al. (1978) on the validity of the Basic Four in ensuring adequate nutrient intake resulted in recommendations for changes to serving sizes in some of the food groups. These recommendations were integrated into a subsequent food guide. Guthrie and Scheer (1981) tested the validity of the Basic Four among college students and concluded that it enabled subjects to meet 80% of their nutrient requirements according to the 1974 Recommended Daily Allowances (RDA). They judged this to be an acceptable percentage, since the Basic Four is only intended to meet 80% of the RDA.

The question of whether or not Americans consume food according to the suggestions of the Basic Four was explored by Loucks (1980). Among 63 female adolescents, only 43% consumed the recommended number of servings from the milk and milk products group, and only 15% met recommended quantities for the fruits and vegetables group. Therefore, from a very brief review of the American literature, it would appear that although the Basic Four provide 80% of nutrient needs, the question of whether or not

Americans actually eat foods in accordance with the Basic Four recommendations is not yet fully established.

Americans appear to share the concern of some Canadian nutrition professionals regarding the appropriateness of teaching food guide principles to young children. Hicks (1977) suggested that teaching elementary school children the concept of food groups is not appropriate, because they are not yet able to apply these principles. Rozin et al. (1986) explored how three- and four-year-olds classify foods. They found that children are not able to group foods until they reach eight years of age. At that point, children are able to classify foods within acceptance and rejection categories. Their classification system is based on attributes such as taste, danger and benefit rather than on nutrient contribution.

American nutrition professionals have expressed concern about the general validity of the Basic Four concept. Hill and Cleveland (1970) reported that the food guide does not reflect nutrient needs, except for nutrients such as calcium which are provided largely from one food group. Hausman (1979) argued that the Basic Four is outdated, since it was initially designed to protect Americans from nutrient deficiencies. However, today's nutritional problems in North America are associated with overabundance and resulting illnesses, such as hypertension and cardiovascular disease. This point of view is supported by Molitor (1980), who suggested that only 10% of the American population is threatened by nutrient deficiency, compared with 20% who are at risk because of overconsumption. In addition, a food guide must recognize changes in the marketplace, such as the increased prevalence of processed and convenience foods. Ratto (1987) agreed that the Basic Four system is too simplistic, since it does not recognize actual food consumption practices of Americans. The total diet approach to a food guide makes it possible to integrate all of these factors in order to reflect current consumption practices.

Thus, although American nutrition professionals do not appear to overtly reject the food group system, there is strong support for further refinement of its underlying principles and presentation. Sloan (1987) has proposed that a

clear, serious presentation of the food group system is necessary for maximum acceptance among today's nutrition-aware American audience.

##### General Issues

Several recommendations and issues have been expressed in the international literature. Ahlstrom and Rasanen (1973) reviewed food guides in 47 countries and found that there is a trend toward simplifying guides so that they contain the smallest number of food groups possible. Based on international experience, they recommend three or four food groups as optimal, since fewer groups mean less material to learn.

Derelian (1988) has also argued for simplicity in a food guidance system — the greater the simplicity of the instructional tool, the more universal its application. Conversely, the more detailed the guide, the narrower its range of usefulness.

Also, foods should be grouped according to consumption patterns that reflect realistic intakes. Consequently, food guides should be specific to their country of origin. In Britain, there has been a recommendation to reclassify the food groups to more accurately reflect present practices and nutritional needs (National Advisory Committee on Nutrition Education, 1983).

A central issue to further food guide development, both in Canada and the United States, is whether to continue to base the guide on a foundation diet of essential intakes, or whether to make it reflect the total diet more adequately (Ratto, 1987; Gillespie, 1987). The total diet approach is a more realistic reflection of present concerns about excess intakes of specific foods and of energy (see Appendix II: Glossary of Terms).

Adaptability of a guide is an issue also raised in the literature. Mutch (1988) suggested that a food guide should not only be adaptable to different ethnic, cultural and economic groups, but also to different dietary groups, such as vegetarians. She also described various food guides used by vegetarians, stressing the difficulty involved in producing one guide for all types of vegetarians.

Gillespie (1985) advocated that a comprehensive food guidance system is central to food guide development. Therefore, not only should a core food guide be developed, but support materials for it, and a variety of methods of delivery, should be developed and implemented as well.

Sustainability of the food supply has been identified as a further concern. Haughton et al. (1987) and Gussow and Clancy (1986) argued that a food guide should be sensitive to the demands it places upon the global food supply.

Truswell (1981) outlined issues of concern regarding the development of food guides: that frequency of consumption of foods be indicated; that present nutrient problems form the basis of a guide; that a food guide be supported by other communication systems; that foods in the guide reflect presently available foods, such as processed and convenience foods; that foods within groups which do not fit the criteria for that group be identified; and that the food guide message be appropriate for the audience.

##### Suggestions for a Food Guidance System

Many countries employ food group systems, yet the number of food groups among these often vary (Table 1). Finch (1981) proposed that Britain retain the food group approach, but redefine the groups for better acceptance among the British population. The author proposed an "Aquarian system" consisting of two parts: a simple food group system and a representation of general nutrition recommendations. Accordingly, foods should be grouped into one of four classes: animal foods, fruits and vegetables, fillers and drinks.

Cronin et al. (1987) have described a new food wheel prepared by the USDA. The food wheel was developed as part of a comprehensive food guidance system. This wheel includes six food groups, expanded from the Basic Four. Of greater significance, however, is the fact that this guide was specifically designed to reflect the total rather than the foundation American diet. The wheel is classified by foods, which are grouped by nutrient contribution.

**Table 1: Examples of Food Groups Systems**

Country (year)	No. of Food Groups	Names of Food Groups
Australia (1982) <sup>a</sup>	5	Bread — cereals Vegetables and fruit Meat and meat alternates Milk and milk products Butter or table margarine
Britain (1978) <sup>b</sup>	8	Cereals Meat Milk and butter Fruit and vegetables Non-dairy fats Preserves Confectionery Alcohol drinks
Canada (1977) <sup>c</sup>	4	Breads and cereals Fruits and vegetables Meat, fish, poultry and alternates Milk and milk products
New Zealand (1981) <sup>d</sup>	5	Meat or fish, eggs or cheese Milk Fruit and vegetables Bread and cereals Other foods (fats, oils, sugar, jam, honey)
Sweden (1981) <sup>d</sup>	8	Meat, fish and eggs Fruit and berries Green vegetables and legumes Carrots, beetroot, turnips and swedes Potatoes Bread and other cereal products Edible fats (margarine, butter, cooking oil) Milk and cheese
United States of America (1979) <sup>e</sup>	5	Vegetables and fruit Bread and cereals Milk and cheese Meat, fish, poultry and beans Fats, sweets and alcohol



##### Sources

- a) Commonwealth Department of Health. 1982. *Dietary guidelines for Australians*. Canberra: Australian Government Publishing Service, 6-8.
- b) Department of Health and Social Security. 1978. *Prevention and Health: Eating for Health*. London: Her Majesty's Stationery Office.
- c) Health and Welfare Canada. 1982. *Canada's Food Guide Handbook* (revised). Ottawa: Minister of Supply and Services, 4-5.
- d) Truswell, S. 1981. "Food Groups for Teaching Nutrition in Australia". *Food and Nutrition* 38:102-103.
- e) U.S. Department of Agriculture. 1979. *Building a Better Diet*. U.S. Department of Agriculture, Food and Nutrition Service, September.

The USDA (1985) reported on the method by which the new food wheel was developed in collaboration with the American Red Cross Association. Recommended numbers of servings were based on data from the USDA's 1977-78 Nationwide Food Consumption Survey. The new food wheel was based on the need to ensure adequate intakes of calcium, iron, magnesium, zinc, vitamin A, vitamin B<sub>6</sub> and folacin.

A recommendation by Gillespie (1984) proposed the use of a nutrient guide. In the latter, foods are listed according to their actual contribution to nutrient intakes, based on American consumption data. Ries and Daehler (1986) evaluated this nutrient guide and found it to be reasonably valid. However, it is a very complex guide which may not be appropriate for the general population.

Another increasingly popular suggestion in the international literature for a food guide system involves depicting the relationship among foods and their recommended frequency of consumption. Truswell (1985) described Holland's food group system, in which four food groups are subdivided. Foods within groups are listed as first preference (for more frequent consumption) or as second preference (for less frequent consumption), based on fat, sugar and fibre content. Truswell (1987) described similar systems in the Netherlands, Sweden and Australia. In the former, a circle with selective partitioning is used to reflect recommended frequency of consumption. Sweden and Australia each depict selective intakes of foods using both a food circle and a food pyramid. In addition, they integrate their nutrition guidelines directly into the food guide.

As discussed, several ideas emerge from the international literature. These include redefining food groups, depicting the relationship among foods and their recommended consumption frequency and using a total rather than a foundation diet approach. The input from nutritionists across Canada confirms these suggestions (Appendix III).

## Issues Emerging from the Literature

From both the Canadian and international literature, several key issues emerge regarding the development, implementation and evaluation of a food guidance system.

### Development Issues

Gillespie (1985) echoed the concern of others in the literature when she argued that the clear elaboration of *goals and objectives* is fundamental to food guide development. She identified three possible objectives of a food guide: to select diets, to evaluate diets and/or to serve as an educational tool. As well, it must be established whether the guide should serve as a goal for the target audience, as a step in achieving a goal or as a combination of both (Gillespie, 1987). From her survey of nutrition professionals in the United States, she also found that the majority favoured a combination of a goal and a step toward attaining a goal.

Several questions regarding the content of a food guide were raised by authors. Of fundamental importance is the question of whether to base a food guide upon a *total or a foundation diet approach*. A total diet approach is increasingly recommended in the literature, since it integrates dietary practices and recent nutrition recommendations. As well, discussion in the literature centres on the *basis of classification* of a food guide. Food groups are usually based on nutrient contribution.

Some authors have also questioned the *validity* of a food guide system. They have explored whether or not an individual following the suggestions of a food guide will actually be assured an adequate nutrient intake. As well, food guides have been criticized for no longer being based on actual nutrient needs nor on current consumption practices. Development of a food guide would necessarily involve verifying that its recommendations achieve the intended goal of nutrient adequacy.

Another issue addressed in the literature is that of *serving sizes*. Authors have argued that present serving sizes in both Canadian and American food guides are frequently not typical of actual serving sizes used by consumers. To encourage maximum acceptability of a food guide, it is recommended that serving sizes reflect current dietary practices. As well, when a total diet approach is used, re-examining serving sizes is even more important, since maximum recommended intakes of foods are included.

#### Implementation Issues

Several issues pertaining to the implementation of a food guidance system were also addressed in the literature. These can be grouped under two headings: design and implementation, and marketing and distribution.

One design issue centred on the importance of *targeting* the food guide appropriately to its intended audiences. Recognition of the level of language and the selection of terms used in the guide were identified as important issues in the literature. Creating high levels of awareness and ensuring maximum use of the guide depend upon a design which makes it acceptable to target audiences.

Another design issue raised was the *adaptability* of a food guide. Authors recommended that a food guide be readily adaptable to the specific nutritional needs of the audience.

The *visual presentation* of a food guide was also addressed in the literature. The layout of a food guide should be visually effective and easy to follow. As well, the guide must be positive in tone for greater acceptability.

Implementation, marketing and distribution issues were also addressed in the literature. Gillespie (1985) argued that a food guide should be one tool in a *comprehensive food guidance system*.

Support materials should be produced and different media explored to serve the needs of specific audiences. Knowledge of the needs of the consumer is therefore essential. As well, potential barriers to use, such as the cost of a food guide and the cost to the consumer of following its suggestions, were identified by several authors.

#### Evaluation Issues

Evaluating the effectiveness of a comprehensive food guidance system in order to adapt it to the reality of the marketplace, as well as to the needs of consumers, was judged essential according to authors in both the Canadian and international literature.

## 5. Issues, Resolutions and Recommendations Related to Food Guidance

The Task Group on *Canada's Food Guide* examined issues related to food guidance. Issues were identified from the literature, from expert input and from task group discussions. Members of the Task Group analyzed and categorized these issues to present the following recommendations on *Canada's Food Guide* to the Communications/Implementation Committee. Issues are classified as developmental, implementational and evaluational.

### Development Issues

#### 1. The need for a clear definition of goals and objectives for a food guide

In order to be effective, an educational tool must have clearly articulated goals and objectives. A food guide is designed to help consumers select foods in order to meet a goal of nutrient adequacy. It is therefore a tool which provides a link between scientific recommendations and dietary habits. In addition, a food guide may either represent an ideal toward which consumers should strive or reflect present food habits, or be a combination of both.

The goal of the current *Canada's Food Guide* is to serve as a framework for choosing foods that meet minimum nutrient needs. This goal is clearly stated in *Canada's Food Guide Handbook*. However, in reviewing *Canada's Food Guide*, members of the Task Group felt the need for closer examination of the purpose it serves. In the course of their examination, members raised the key issue of recognizing the concept of the total diet.

#### 2. The need to recognize the total diet

A major issue debated in the literature is whether to base a food guide on a foundation or on a total diet approach. Traditionally, food guides were designed on a foundation basis, in which minimum food intakes were suggested to meet a percentage of nutrient requirements. The rationale for this design was the prevention of nutrient deficiency diseases, which was a major concern in the war years when food guides were initially developed. Food guides based on a foundation diet, of which *Canada's Food Guide* is one, are therefore designed to meet less than 100% of recommended energy and nutrient intakes of users. Increases in energy intake, and therefore in the quantity of food consumed, would increase nutrient intake accordingly.

A food guide based on a foundation diet cannot by definition fully integrate nutrition recommendations which deal with overconsumption of energy or of specific nutrients. In *Canada's Food Guide*, three key concepts of the 1977 Nutrition Recommendations for Canadians were represented: variety, moderation and energy balance. However, maximum suggested levels of food intakes that numerically translate the concepts of moderation or of energy balance were not included, and foods that did not fit into any of the food groups were not acknowledged.

A food guide based on a total diet may be designed to integrate current Nutrition Recommendations as part of suggested food intakes. Ranges of maximum and minimum food intakes can be included to address nutritionists' concerns regarding excess intakes of specific nutrients and non-nutrients. The majority of Canadians are no longer at risk for nutrient deficiency diseases. Rather, chronic diseases for which excess food intakes are responsible have



become issues for public health. Today, nutrition professionals are especially concerned about excess intakes of energy and total dietary fat, for example. Therefore, a food guide based on a total diet approach can make food selection recommendations designed to reflect, both quantitatively and qualitatively, current nutrition recommendations. This provides assistance to consumers in bridging the link between food selections and scientific recommendations related to health promotion and risk reduction.

As well, a total diet approach offers the advantage of encouraging the selections of foods to meet recommended nutrient and energy intakes for selected groups such as preschoolers, school-aged children, adolescents and adults, including pregnant and lactating women. Using composite data, ranges of intakes can be specifically generated for each of these groups.

Shifting the basis of a food guide from a foundation to a total diet approach makes possible a unified system which communicates the message of healthy eating along with current nutrition recommendations for all age and physiological groups in the population. The Task Group on *Canada's Food Guide* recommends that:

***Canada's Food Guide should be based on a total diet approach that promotes dietary adequacy while integrating the most current Nutrition Recommendations.***

Since the Task Group recommended a change in the basis of *Canada's Food Guide*, members of the Group generated a new statement of purpose for the Guide. Essential components of the new statement of purpose are: "realistic framework", "healthy Canadians", "dietary adequacy" and "over two years of age". Members of the Task Group advocated the importance of the achievability of food guide suggestions. Also, the Guide was only perceived as providing a guideline for healthy eating rather than a detailed outline of nutritional care. Consequently, the Guide should only be used among healthy Canadians. Consumers on diet therapy require personalized tailoring of *Canada's Food Guide* by a nutrition professional.

As well, the issue of age was raised. The current *Canada's Food Guide* is intended for those over the age of two, since major changes occur in the quality and quantity of foods consumed in the first two years of life. After a person passes the age of two, the basic premises of healthy eating apply throughout their lifecycle. Members of the Task Group supported this suggestion.

The resulting statement of purpose recommended by the Task Group is presented below.

**The statement of purpose for *Canada's Food Guide* should read: "*Canada's Food Guide is a realistic framework to assist healthy Canadians over two years of age in selecting foods to promote dietary adequacy.*"**

### **3. The need for identifying the uses of a food guide**

At present, *Canada's Food Guide* is used to choose foods, to evaluate food intakes and to plan meals. It is also incorporated into legislation affecting institutional food services. *Canada's Food Guide* is entrenched in nutrition education programs across the country, and is widely employed as an educational tool by nutrition professionals and paraprofessionals.

Some nutrition professionals have expressed concern that the present food guide is at times not being used appropriately. It was not intended to serve as a diagnostic, treatment or research tool to assess nutrient status. It is appropriate for diet counselling in evaluating general dietary adequacy only, and may therefore be used as a screening tool to identify individuals who may require more precise nutritional assessments of their diet. Thus, *Canada's Food Guide* should be used to assess food rather than nutrient intake. The Task Group on *Canada's Food Guide* therefore recommended a clear elaboration of appropriate uses for the Guide.

***Canada's Food Guide may be used:***

- **for planning and selecting foods to promote health maintenance and risk reduction of chronic diet-related diseases among healthy Canadians over two years of age;**

- as a guideline or reference standard for legislation for institutional food services;
- by individuals, to provide a general assessment only of their dietary intake; and
- as an educational tool targeted to the needs of specific groups.

The Task Group on *Canada's Food Guide* stressed that not only should the Guide be used appropriately, but it should also continue to be widely used. Canadian nutrition professionals have suggested that the present Guide has potential for even greater use among all segments of the Canadian population.

Three criteria were chosen to describe foods contained in the Guide to ensure its maximum use: acceptability, affordability and accessibility. In order to achieve acceptability, a wide variety of different foods need be offered within food groups. This is needed in order to appeal to different ethnic and cultural groups, such as Canada's Native people, and to different age and physiological groups, such as young children.

The issue of affordability is intrinsic to food guide use.<sup>5</sup> One reference in the American literature indicates that foods for a diet which includes heart health recommendations may be more costly than foods recommended in the Basic Four food groups.

Therefore, a food guide based on a total diet may be more costly to the consumer. If consumers cannot afford to follow food guide recommendations, the potential for reducing the risk of chronic disease through healthy eating will be severely limited. As well, if foods in a guide are to be fully accessible to consumers, they must not only be physically available to them on a

regular basis, but also financially accessible to them. The Task Group on *Canada's Food Guide* recommends that:

To ensure widespread use of the food guide, foods contained in it should be readily accessible, affordable and acceptable to consumers. A variety of foods should be displayed within each food group to promote maximum acceptability of the Guide.

### 4. The need for an appropriate title

Feedback from nutrition experts in Canada suggested that *Canada's Food Guide* could create an even greater impact by the enhancement of its public image. Some nutritionists argued that the image of the Guide might be strengthened by assigning it a different title. On the other hand, the evaluation of *Canada's Food Guide* and Handbook revealed that the majority of nutrition professionals and paraprofessionals were aware of the publication entitled "Canada's Food Guide" (Health and Welfare Canada, 1979a). As well, the Guide presently enjoys widespread national use and is cited frequently in legislation regulating institutional food services. Unfortunately, a consumer-based evaluation of the Guide's title has not been performed.

Because of the difficulty involved in resolving this issue, and the fact that an evaluation of the title among consumers has yet to be undertaken, the Task Group on *Canada's Food Guide* recommends that:

A new title should be considered for *Canada's Food Guide* in accordance with results of consumer research studies. The research should investigate the desirability of retaining "Canada's Food Guide" as part of the title.

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5 For some consumers, income is a limiting factor in selecting foods. Income-support programs should be designed to ensure that consumers can afford foods for a healthy diet.



### 5. The need to establish concepts contained in a food guide

Those who design food guides face the challenge of effectively translating concepts which reflect scientific recommendations into practical, meaningful suggestions for food selections by consumers. Three concepts from the 1977 Nutrition Recommendations for Canadians in the current Food Guide are variety, moderation and energy balance. Results of the Concepts Evaluation Study of 1979 revealed that the terms "moderation" and "variety" were poorly understood by Canadians (Health and Welfare Canada, 1979b). Thus, expressing these concepts in a meaningful way, both visually and in writing, is a continuing challenge.

In the existing Food Guide, these three concepts were stated on the reverse side of the Guide, separate from the daily food intake suggestions. Consumers themselves were responsible for translating these principles into daily food selections. This may have been an obstacle to the effective translation of these principles into dietary practices.

### 6. The need to establish the organization of food guide contents

*Canada's Food Guide* presently contains four food groups, each accompanied by recommended numbers and quantities of daily food selections. Bearing in mind the nutrient needs of Canadians, food groups were established based on nutrient contribution and commodity, reflecting food consumption patterns. Some authors in the American literature have argued that this form of food classification is obsolete. Instead, foods should be classified only by nutrient contribution to the total diet. As well, from the American literature it appears that consumers themselves do not classify foods by commodity type, but by groups which are meaningful to them.

It is not known by what criteria Canadians classify foods. Consumers' classification systems may, for instance, be based on the location of food in the grocery store, their nutrient contribution or their role in a meal. Canadian consumers and nutrition professionals may also employ different

classification systems. Research on food classification systems could not be found in the Canadian literature.

However, the existing food groups are widely used by Canadians for instructional purposes. Feedback from nutrition professionals suggested that the present food group system be retained. However, many nutrition professionals stressed the need to determine whether adherence to food group recommendations actually ensures dietary adequacy.

Since the types of foods currently available to consumers continue to grow in number, nutritionists recommended that food groups might be expanded to include foods previously not recognized in the Guide, such as convenience foods and mixed foods. Doing so may necessitate either enlarging the scope of existing food groups or increasing the number of categories.

In addition, a frequently advanced suggestion of nutrition professionals, as well as authors in the literature, was that foods within food groups be placed in a hierarchy of recommended frequency of consumption. Best choices within groups, or those which should be consumed more frequently, could be highlighted, based on such factors as nutrient density and current scientific recommendations. This would further assist consumers in translating scientific evidence into daily food selections.

The Task Group on *Canada's Food Guide* recommends that:

**Canada's Food Guide should retain a food group classification system that considers the four current food groups and emphasizes foods that best meet up-to-date nutrition recommendations. Consumer research should be done on the following:**

- What criteria should be used to classify foods in the Guide?
- How valid is the Guide in suggesting food selections that promote dietary adequacy for each age and physiological group?

### ■ How can convenience foods, mixed foods and foods consumed away from home be classified in the Guide?

Food groups should reflect actual food practices, not only in the foods they contain but also in the numbers and sizes of servings. Serving sizes recommended in the Food Guide may not be consistent with a serving size as perceived by the consumer. For example, consumers are not likely to consider a half a cup of spaghetti to be a usual serving size.

Also, current serving sizes may not be practical for consumers — a whole apple is more convenient to eat than is half an apple. The Health Protection Branch of Health and Welfare Canada is presently generating data on typical serving sizes used by Canadian consumers of all ages. This data might support research on *Canada's Food Guide* serving sizes and numbers.

Specific age and physiological groups, such as preschool children and pregnant women, may require specific serving sizes or numbers of food servings — preschool children may consume smaller food servings, whereas pregnant women may require a greater number of food servings. A food guide would have to be adaptable to the nutritional needs of all age and physiological groups.

In addition, a review of current serving sizes and numbers is imperative when the basis of a food guide is shifted from a foundation to a total diet approach. Maximum food intakes are expressed in such a guide along with serving sizes and numbers. The Task Group on *Canada's Food Guide* recommends that:

**Recommended serving sizes in the context of the total diet approach of *Canada's Food Guide* should be based on consumer dietary practices. The number of servings should be determined according to the Recommended Nutrient Intakes for Canadians and the revised Nutrition Recommendations. It may be necessary to modify serving sizes or numbers to meet the nutritional needs of**

some users. For example, serving sizes for children should be smaller while the number of recommended servings for pregnant and lactating women should be greater.

### 7. The need to base food guide suggestions on a weekly or daily time frame

*Canada's Food Guide* presently makes recommendations for food selections on a daily basis. Some authors in the literature have argued that a longer time period is necessary to accommodate day-to-day variations in dietary intakes. This was felt to be especially important for children, since variations in their intakes are common.

Several arguments exist to retain the daily time frame. Nutrition professionals in Canada have suggested that daily recommendations are preferable, since mental recall of foods is more effective over shorter periods of time. As well, individuals tend to plan food intakes on a short-term basis, usually daily.

A food guide based on a total diet approach will include not only minimum but also maximum food intakes. Therefore, there will be larger numbers of servings compared to those found in a food guide that is based on a foundation diet. Were the Guide to make weekly rather than daily recommendations of intakes, the number of servings would increase by a factor of seven, which may seem overwhelmingly high to some consumers.

The Task Group on *Canada's Food Guide* recognized the need for a food guide to be user-friendly; that is, practical and meaningful to the consumer. A daily time frame appeared to best meet this requirement, although consumers must be advised that day-to-day variations in food intakes are normal.

*Canada's Food Guide* should continue to base its suggestions on a daily food intake. The Guide should contain a note stating that day-to-day variations in intakes are normal and not harmful.

### 8. The need to recognize sustainability of the food supply

Feedback from some nutrition professionals as well as some reports in the literature advocated the need to design food guides to recommend locally available foods, to ensure a sustainable food supply. Some health units in Canada have produced their own food guides which promote the use of local produce. In these guides, fewer imported foods are offered within each food group, since local agriculture influences the guide's contents.

While recognizing the value of encouraging a sustainable food supply, other nutrition professionals have argued that reducing the number of foods offered within food groups will limit the degree of variety in the guide. In addition, removing foods not locally produced, such as oranges and bananas, will require substantial changes in the diets of Canadians in which imported foods are standard fare. As well, a very location-specific food guide would, by definition, make it most suitable to the immediate area in which it was developed. Consequently, such a food guide would not lend itself to a national nutrition education program, whereas the present *Canada's Food Guide* does. The Task Group on *Canada's Food Guide* therefore recommends that:

**Foods in *Canada's Food Guide* should not be limited to those produced locally, in order to maintain the greatest possible variety within the Guide and to minimize unrealistic changes in dietary habits.**

## Implementation Issues

### 9. The need for an effective visual presentation of a food guide

At present, *Canada's Food Guide* is depicted by a circle, with a sun in the centre. The circle is divided into four equal parts within which are drawings of foods. The circle design was chosen to reflect the unique contribution made by each of the four food groups to dietary intake. This design promotes the concept of unity, such that the four food groups together constitute a whole. Foods

were drawn rather than displayed with real photographs in order to emphasize flexibility with different groups — consumers would not feel that foods in a particular group were limited to those displayed in the photograph. For example, a graphic design of a fish suggests fish in all its forms may be consumed, while a photograph of fish fillets may give the impression that only fish in this form is acceptable.

Feedback from some nutrition professionals in Canada has suggested that a different visual presentation of *Canada's Food Guide* may increase its impact among consumers. Especially noted was the desire to change the food drawings to actual photographs of foods. Unfortunately, a formal evaluation of the visual presentation of the Food Guide among Canadian consumers has yet to be performed. Therefore, consumer acceptability of the present design cannot be assessed.

However, a further argument for re-examining the visual presentation of *Canada's Food Guide* stems from the fact that the Task Group recommended a shift in the basis of the Guide from a foundation to a total diet approach. A different visual presentation may more suitably express the concept of a total diet, especially if hierarchies of recommended consumption frequency are displayed within each of the food groups.

Nutrition professionals who have designed food guides for their own health units have explored different designs, such as rainbows and pyramids. From the literature, frequently described designs include both regular and inverted pyramids and wheels. Regardless of the particular design chosen, authors in the literature highly recommend that the design be simple, meaningful and adaptable, and that it have positive, straightforward, comprehensible text in order to be widely used and understood by different segments of the population. It is possible that one main visual presentation could be selected to meet the needs of the largest target audience and modifications made for other target groups.

In order to decide on an effective visual presentation, experts in design and communications should be consulted. However,



an assessment of consumer response to various designs will be a critical element in the selection process.

**In order to determine an effective visual presentation of *Canada's Food Guide*, consumer research should be done and appropriate design and communication expertise sought. The design chosen should be simple, clear and adaptable and the text be positive, straightforward and comprehensible.**

### 10. The need for effective distribution of a food guide

At present, *Canada's Food Guide* is distributed jointly, free of charge, by both the federal and provincial governments to government and non-government groups, and to individuals upon request. Copyright is held by Health and Welfare Canada, and permission must be sought from this department to reproduce the Guide in whole or in part. The fact that the Guide is distributed free to the consumer eliminates cost as a potential barrier to widespread use of the Guide. Members of the Task Group on *Canada's Food Guide* recommend that:

**Health and Welfare Canada should continue to hold copyright for *Canada's Food Guide* and distribute it free of charge.**

### 11. The need for effective implementation of a food guide in the context of a comprehensive food guidance system

Recommendations in the literature on implementing food guides advance the concept that, for maximum impact, a food guide should be supported by a comprehensive food guidance system. A food guide forms the core around which other nutrition information is organized. *Canada's Food Guide* currently exists in the form of a two-sided leaflet complemented by an explanatory sheet for the public and a handbook for nutrition educators. Both the literature and contributions from nutrition professionals suggest that potential remains for developing and making more effective use of various support materials, including educational tools that supplement information already provided in the Guide.

This is especially important for a food guide based on a total diet approach, where information on food is organized to encourage food selections to meet two objectives: dietary adequacy and moderation in the consumption of specific nutrients and non-nutrients that are linked to chronic diet-related diseases. In addition, one main guide could be produced, and modified forms and support materials developed from it for specific groups such as Native people, various ethnic groups and lower-literacy groups. The Task Group recommends that:

***Canada's Food Guide* should serve as the core educational tool in a comprehensive food guidance system. It should be adaptable to specific target groups and supported by existing materials such as the Handbook (revised accordingly) as well as by new support materials.**

A dietary guidance system, with a food guide as the core, is one component of a total communication and marketing strategy. The effective communication of food guidance recommendations involves exploring many possible methods. Some Canadian nutritionists suggested using such methods as point-of-purchase displays, mass media, nutrition labelling and school programs. Expertise is necessary to design materials and select communication methods for intended audiences. The Task Group on *Canada's Food Guide* recommends that:

**A marketing and communication strategy should be developed to effectively relay *Canada's Food Guide* messages to consumers and communicators of nutrition information.**

## Evaluation Issues

### 12. The need for evaluating a food guidance system

*Canada's Food Guide* has been formally evaluated among nutrition professionals and paraprofessionals (Health and Welfare Canada, 1979a). A need exists for a current evaluation of the Guide, or of any new form of it, firstly among consumers and secondly among communicators

of nutrition information. Authors have emphasized the importance of evaluating food guide characteristics such as graphics, visual presentation, text, level of language and the food classification system it employs. Most importantly, the impact of a food guide on consumer behaviour must be determined. In addition, not only should a guide be evaluated, but so too should the entire food guidance system, including support materials developed to complement the food guide.

Both formative and summative evaluation methods are essential for effective assessment of a program. Focus-group testing may be useful during formative evaluations in providing information on whether the various features of a food guidance system, as described above, are acceptable and comprehensible. Formative evaluation could provide information about the implementation of a food guidance system, and summative evaluation may be of use in assessing the impact of the system.

Systematic evaluations should be done on a regular basis to ensure that a food guidance system is responsive to the needs of consumers and communicators of nutrition information. The Task Group on *Canada's Food Guide* suggested that a realistic interval between evaluations may be five years, or earlier if necessary. The Task Group recommends that:

**Canada's food guidance system should be evaluated periodically (every five years or as necessary) among consumers and communicators of nutrition education, employing formative and summative evaluation methods.**

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# Appendix I

## Task Group on Canada's Food Guide

### Terms of Reference

#### Mandate

To provide support to the Communications/Implementation Committee in recommending the expression of updated nutrition recommendations as dietary advice for the consumer by:

- (1) reviewing the literature addressing:
  - a historical overview of Canada's Food Guide and Handbook including development, validation, implementation and evaluation;
  - consumer research findings regarding issues such as awareness, use, acceptability of and compliance with the Guide; and
  - experiences with food guides of other organizations (such as the Canadian Diabetes Association) and countries (such as Australia, the United States and the United Kingdom).
- (2) accessing expert input (from the U.S.D.A., A. Gillespie and federal/provincial/territorial nutritionists)
- (3) accessing user input through professionals and paraprofessionals
- (4) identifying issues concerning a new, revised guide based on literature review and expert and user inputs
- (5) analyzing the issues in the context of the scientific statements provided by the Scientific Review Committee in updating the nutrition recommendations
- (6) preparing progress reports and a final report including recommendations on a new, revised guide (such as format, style, approach and name).

#### Membership

Members are recognized experts in nutrition, education and communications from government and non-government organizations.

#### Reporting Mechanism

The Task Group reports to the Chairman of the Communications/Implementation Committee through the Coordinator of the Communications/Implementation Committee.

A progress report is to be submitted in July, 1988; a preliminary report is to be submitted in October, 1988 and a final report in December, 1988.

#### Meetings

Three meetings are to be held between July 11, 1988 and December 31, 1988.

## **Task Group on Canada's Food Guide**

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# Appendix II

## Glossary of Terms

**communicators of nutrition information:**

Communicators of nutrition information are individuals or groups who use *Canada's Food Guide* and other nutrition-related publications to educate an audience. Examples of nutrition communicators are teachers, nurses, nutrition professionals and the mass media.

**food guide:** A food guide is the central tool in a food guidance system and visually depicts a pattern of recommended food selections to meet recommended nutrient intakes.

**food guidance system:** A food guidance system is an educational program which translates scientific nutrition recommendations into appropriate food selections for consumers. It usually centres around a food guide which provides a framework of food groups. The food guide is the core around which other supplemental and supportive nutrition information is organized.

**formative evaluation:** Formative evaluation is one method of assessing an educational program to determine the effectiveness of its development and implementation. It refers to activities associated with the ongoing operations of a program.

**foundation diet approach:** A food guide based on a foundation diet approach recommends minimum food intakes to meet a percentage of recommended nutrient intakes. The rationale for this design is the prevention of nutrient deficiency diseases. *Canada's Food Guide* is based on a foundation diet approach.

**summative evaluation:** Summative evaluation is one method of assessing an educational program to measure its impact, or the extent to which a program has achieved its intended objective(s).

**total diet approach:** Using a total diet approach, a food guide organizes information about food so that it can be used to make food selections that meet objectives for both nutrient adequacy and moderation of food consumption relative to risk for specific chronic diet-related diseases. A food guide based on the total diet approach integrates current nutrition recommendations into food selection suggestions.



# Appendix III

## Input on Food Guidance Systems

### General Comments

Input on food guidance systems was sought from members of the Federal, Provincial and Territorial Group on Nutrition, nutrition educators with milk marketing boards and dairy foundations across Canada, provincial dietetic association nutrition committees and the Canadian Dietetic Association Nutrition Committee. A total of 69 responses were received from across Canada (50 from public health nutritionists, 9 from milk marketing boards, 10 for dietetic association nutrition committees).

The request for input was well received. The number of respondents exceeded the number of original contacts, as nutritionists encouraged their colleagues to respond. Respondents expressed appreciation for being involved in the process and many offered further assistance. For example, one province volunteered as a test base for further activity and one territory offered to share experience of adapting Canada's Food Guide to illustrate country food. Four respondents submitted copies of food guides used in their jurisdictions.



## Results

1. Dietary guides have been used for selecting and evaluating diets and as educational tools. How important is it that a dietary guidance system serve as a tool for each of the following?

	Total*	P.H.N.*	M.M.B.N.*	D.A.N.C.*
a) To help consumers select a nutritionally adequate diet				
Very important	52	37	6	9
Quite important	6	3	2	1
b) To help consumers evaluate their own food intake				
Very important	40	31	5	4
Quite important	15	7	3	5
Somewhat important	2	1	0	1
Not important	1	1	0	0
c) For nutrition education programs				
Very important	42	29	6	7
Quite important	14	9	2	3
Somewhat important	1	1	0	0
d) Other, please specify:	12	8	1	3

Other suggestions were:

- to develop modified systems for diet therapy
- to encourage the food industry to make suitable products
- to communicate nutrition recommendations to other professionals

**NOTE:** Responses to this question revealed a point of controversy. On one hand, some nutritionists are of the opinion that a dietary guidance system could be applied without expert help, while other nutritionists indicated the need for "teacher" assistance.

\* Total responses, responses from public health nutritionists (P.H.N.), milk marketing board nutritionists (M.M.B.N.), dietetic association nutrition committees (D.A.N.C.).

## 2. How important is it that a dietary guidance system help users learn about each of the following?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) How to select an adequate diet				
Very important	56	38	9	9
Quite important	1	1	0	0
Somewhat important	2	1	0	1
b) Nutrient needs/requirements				
Very important	4	2	1	1
Quite important	24	16	2	6
Somewhat important	24	17	5	2
Not important	7	5	1	1
Uncertain	1	1	0	0
c) Nutrient composition of foods				
Very important	8	6	1	1
Quite important	15	9	3	3
Somewhat important	26	20	1	5
Not important	6	3	2	1
Uncertain	4	2	2	0
d) Relative nutrient contributions of foods				
Very important	12	10	1	1
Quite important	24	15	3	6
Somewhat important	23	16	3	4
Not important	1	0	1	0
Uncertain	2	0	2	0
e) Diet-health issues				
Very important	14	12	1	1
Quite important	21	16	4	1
Somewhat important	10	7	3	0
Not important	3	2	1	0
f) Other, please specify:	10	8	0	2

No other suggestions per se were provided. Rather, comments in this category focused on clarification of responses provided under a) to e). The need for more nutrient-centred information to support nutrition labelling was revealed. Some respondents questioned the complexity of the outcome. (Could one system meet many needs?) The importance of selecting a primary purpose and building a dietary guidance system to meet that purpose was emphasized.

3. What type of standard should a dietary guidance system use to help users select a diet?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) a food standard (e.g. four food groups)	61	44	7	10
b) a nutrient standard (e.g. nutrient density)	8	5	2	1
c) Other, please specify:	6	5	0	1

A combination of a food standard and a nutrient standard was suggested.

4. Some guides, such as *Canada's Food Guide*, emphasize a foundation diet which specifies *only basic food needs*. Others consider the total diet, or *all foods consumed*. Which do you think a dietary guidance system should assist the user to select?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) A foundation diet	19	13	1	5
b) A total diet	38	24	8	6
c) Other, please specify:	5	3	0	2

No other suggestions per se were provided. Rather, comments served to support the decisions regarding foundation or total diet. Some favoured total diet because of the need for addressing fat, sugar, water, vitamin supplements, alcohol, etc. Concern was expressed over the rigidity of a total diet — specified large numbers of servings of breads and cereals for pregnant women and the degree of sophistication required for understanding. The foundation diet was also considered appropriate if supported by an education program.

5. Some feel that a guide should not require individuals to make changes in their current diets. Others view guides as goals to work toward which may be quite different from current food consumption patterns. What kind of a diet do you think a dietary guidance system should assist users to select?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) The best possible diet (as nearly as can be defined); that is, it should set a goal for users	20	15	3	2
b) A diet that is reasonably adequate but not too different from users' current food consumption patterns	3	2	0	1
c) Somewhere between 1 and 2	35	21	6	8
d) Other, please specify:	2	2	0	0

In this question, the feasibility of implementing an optimal diet was a concern for respondents.

6. Most guides are based on nutrient needs; however, the way in which these are translated into foods varies. Some are very general and others are quite specific. How do you think users should be able to identify foods?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) <i>By classes only</i> according to nutrient content common to the class	8	5	2	1
b) <i>By classes, but also compare foods within these classes</i> according to nutrient content	48	33	7	8
c) <i>By individual foods</i> according to nutrient content without using classes	0	0	0	0
d) <i>Only by specified characteristics</i> , (e.g. low fat, high vitamin C)	1	1	0	0
e) Other, please specify:	4	2	1	1

The focus of responses was to qualify the decision regarding comparison of foods; that is, to highlight best choices according to major nutrients such as fat, carbohydrate and calcium.

7. In a dietary guidance system, if foods were put into classes how should they be classified?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) By commodity group, e.g. dairy, meat, vegetables	28	17	4	7
b) By classes significant to nutritionists, e.g. high vitamin C, nutrient density	10	9	0	1
c) By new classes based on consumers' perceptions	12	8	1	3
d) Other, please specify:	12	8	4	0

A combination of classification was suggested, such as commodity and nutrient content, commodity and consumer perceptions, nutrient content and consumer perceptions. Usage of food was also volunteered as a further classification to be combined with those suggested.

8. Besides helping users to select adequate diets, how important is it that a dietary guidance system also help users to:

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) Satisfy individual food preferences				
Very important	32	20	5	7
Quite important	18	12	3	3
Somewhat important	6	5	1	0
Not important	3	2	0	1
Uncertain	1	1	0	0
b) Meet individual economic constraints				
Very important	22	13	5	4
Quite important	19	11	3	5
Somewhat important	6	4	1	1
Not important	2	2	0	0
Uncertain	1	1	0	0



8. Besides helping users to select adequate diets, how important is it that a dietary guidance system also help users to (*continued*):

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
c) Minimize food procurement and preparation time				
Very important	12	7	2	3
Quite important	20	1	33	4
Somewhat important	22	15	2	5
Not important	3	2	1	0
Uncertain	3	2	1	0
d) Other, please specify:	14	11	3	0

Other suggestions were:

- to incorporate ethnic food patterns
- to meet food availability constraints in isolated areas
- to sustain local agriculture

Some respondents questioned the ability of the system to be multifunctional. As an alternative, the requirement for supportive and educational tools and programs was identified for particular user groups.

9. On which of the following should a dietary guidance system put the most emphasis?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) Food constituents for which there is evidence that level of consumption is needed	30	20	4	6
b) All nutrients for which Recommended Nutrient Intakes (RNI) have been established	7	3	1	3
c) All nutrients for which RNI have been established and for which there are adequate food composition data	19	15	3	1
Uncertain	2			

10. How important is it that a dietary guidance system cover the nutritional value of:

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) Foods as purchased				
Very important	27	16	4	7
Quite important	16	11	2	3
Somewhat important	8	6	2	0
Uncertain	5	3	2	0
b) Foods as prepared at home				
Very important	44	33	5	6
Quite important	15	11	0	4
Somewhat important	1	0	1	0
Not important	3	1	2	0
Uncertain	3	1	2	0
c) Institutionally prepared foods				
Very important	13	8	2	3
Quite important	18	12	0	6
Somewhat important	15	10	2	3
Not important	8	5	2	1
Uncertain	4	2	2	0

NOTE: It was further suggested that a dietary guidance system should be based on the nutritional value of food "as consumed". A complicating factor is the inconsistency of food preparation methods.

11. How many foods should a dietary guidance system include?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) As many different foods as people might eat	11	9	2	0
b) It should include only foods commonly eaten	10	4	2	4
c) A minimum number of foods which represent entire classes or categories of foods	28	20	5	3
d) Other, please specify:	6	5	1	0

Combinations of a) and b), and b) and c) were also suggested.

## 12. Do you think new dietary guidance systems are needed?

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
a) Yes	43	29	7	7*

**Reasons:**

The present system:

- does not address current nutritional concerns of consumers;
- does not reflect recent research on nutrient intake (fat, carbohydrate, calcium, fibre, sodium) and chronic diseases;
- does not accommodate new food technology, multiculturalism, today's eating habits (eating out, vegetarianism, convenience and exotic foods);
- is "childish" in graphics and needs to be changed to convey importance and to compete with other materials on dietary advice utilizing more recent communication techniques;
- is too simplistic and does not meet the needs of more sophisticated consumers;
- does not address comparisons within a food group; and
- is not readily used nor understood by consumers.

However, some respondents expressed the opinion that a totally new guidance system will confuse consumers after all the years of education based on the current system which uses *Canada's Food Guide*.

	Total	P.H.N.	M.M.B.N.	D.A.N.C.
b) No	9	8	1	0*

**Reasons:**

- *Canada's Food Guide* is still a satisfactory and useful tool and awareness of it is increasing.
- Increases in the amount of information may complicate the Guide, limiting comprehension and adherence and may focus teaching on the individual facts which are subject to change.
- Suggestions for enhancing the present food guide were also provided:
- concentration on communication/implementation strategies;
- accommodation of additional aims previously identified through support materials;
- modification of graphics to "refresh" visual presentation and to target different populations.

\* Three respondents did not receive this question.

## Further Suggestions

### Suggestions for the Presentation of a Dietary Guidance System to the Consumer

Dietary advice should be:

- simple, clear and practical with realistic goals and consistent messages, and national in scope. Consistency in conveying messages from governments and health associations is needed to reduce confusion;
- based on a minimal number of defined nutrition concepts;
- adaptable to different groups (low-income, health professionals, preschoolers, Native Canadians, more sophisticated consumers, ethnic populations);
- presented in such a way that the consumer is empowered to make food choices independent of professional assistance, tables and lists, and thereby influence the food supply; and
- implemented through social marketing techniques.

The format needs to be concise and appealing (two-sided information sheet, consolidation of messages, colorful pictures and diagrams) in order to reach low-literacy groups.

Language and terminology should be:

- understood by consumers. The public has difficulty in interpreting statements and terms such as “no more than x % of calories from fat”, “alternates” and “breads and cereals”.
- positive and non-threatening, with emphasis on “what to eat” rather than on “what *not* to eat” and an assumption that people are interested in making nutritious food choices.

Content should be modified:

- to be based on what consumers want to know rather than what professionals want them to know;
- to include a statement that *Canada's Food Guide* is relevant to those over two years of age;

- to give a better explanation of the principles of variety, energy balance (healthy weight) and moderation;
- to promote physical activity as a complement to good nutrition;
- to incorporate more realistic portion sizes;
- to expand the number of food groups to include fats and oils; and
- to provide practical tips on applying the information in the Guide, such as increasing particular nutrient intake, purchasing and preparing nutritious food.

**NOTE:** A few respondents expressed concern that drastic changes to *Canada's Food Guide* would have a detrimental effect on restructuring educational materials and re-aligning survey results. Current use of the Guide and budget constraints are factors to consider in revising *Canada's Food Guide*. Concern was also expressed over the ability of the food supply to conform to the proposed recommendations to reduce fat, refined sugar, etc.

Examples of dietary guides currently in use were cited in support of suggestions provided (references 1 to 4).

### Suggestions for Support Materials for a Food Guide

For consumers:

- self-assessment tools
- materials (including appropriate translations) for native and other ethnic groups, illiterate populations and motivated consumers
- supplemental sheets, including grocery shopping tips, food preparation and nutrients such as salt, sugar, fat, alcohol and fibre in fast foods and snacks
- pocket-size version of *Canada's Food Guide* and related material
- computer programs
- videos demonstrating meal-planning using the Guide and tips on food selection
- examples of healthy lifestyles

For educators:

- teaching modules
- guide for menu-planning, including low-budget meals
- assessment tools

### **Suggestions for Implementing a Dietary Guidance System**

General comments:

- The Food Guide must be taught, not "handed out".
- The training of educators for consistency in implementation of programs is critical to the success of the programs.
- There must be easy access to related publications.
- The Guide must be available free of charge.
- Support documents, either costed or free of charge, should be developed.
- Needs assessment studies are required to determine communication strategies.

Mass-media programs:

- The mass media is instrumental in increasing the visibility of dietitians/nutritionists as nutrition experts.
- Newspapers, television, popular literature and magazines, and new approaches such as computer games and programs and videocassette programs, can be used in waiting rooms and in nutrition-based games.
- Media representatives may require supplementary written materials (brochures, pamphlets).

Point-of-purchase programs:

- Nutrition labelling must be simple.
- Nutrition information techniques should be expanded to apply to fresh produce.
- There should be logos for new products in order to motivate the industry.
- Banners in grocery store departments should be colour-coordinated to food groups.

- Food manufacturers should receive nutrition education.

School programs:

- Nutrition programs should be integrated in lifestyle education (food purchasing, budgeting, family planning, etc.).
- Nutrition education should be required for both teenage boys and girls.

Community-based programs:

- This is a less-favoured type of program.
- It currently lacks sufficient resources to be effective.

### **Suggestions for Evaluating a Dietary Guidance System**

- Consumers should be involved in pre-testing.
- The validity of a food guidance system in meeting nutrition recommendations should be pre-tested.
- There should be periodic evaluations in terms of usage, positive aspects and limitations, with revision of the system as required.
- An adequate nutrition monitoring system should be in place to assess dietary intakes of Canadians.



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*Report of the  
Technical Group on  
Canada's Food  
Guide to the  
Communications/  
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Committee*



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# Acknowledgement

The Technical Group for the Review of *Canada's Food Guide* gratefully acknowledges all those who have contributed data for this report.



# 1.

## Executive Summary

This report is a working document of the Technical Group for the Review of *Canada's Food Guide* in support of the work of the Communications/Implementation Committee, Health and Welfare Canada, for the review of Nutrition Recommendations for Canadians. Recommendations of the Technical Group are submitted to the Communications/Implementation Committee. The mandate and membership list of the Technical Group are provided in Appendix I.

Health and Welfare Canada has undertaken to revise the Nutrition Recommendations for Canadians to ensure that these recommendations continue to promote and maintain health while reducing the risk of nutrition-related diseases. As part of the process of translating the revised recommendations into dietary advice for Canadians, Health and Welfare Canada appointed a task group to review *Canada's Food Guide*, the key nutrition education tool in Canada (Health and Welfare Canada 1982). To further support the work of the Communications/Implementation Committee in recommending changes to *Canada's Food Guide*, a technical group was formed to assess the practical implications of shifting from a foundation to a total diet food guide and the nutritional adequacy of the Guide according to the revised Nutrition Recommendations.

In fulfilling its mandate, the Technical Group developed a food guide, referred to as the Base Food Guide, by defining a food classification system, establishing nutrient criteria for each food group, and specifying numbers and sizes of food servings. Initial steps were taken to establish acceptable ranges in the number of food servings for various physiological groups. In order to comply with the Base Food Guide, Canadians will have to make changes in their eating habits. The Base Food Guide will also have an impact on the food supply, and will require the development of educational programs.

Based on the analyses, the Technical Group for the Review of *Canada's Food Guide* submits the following recommendations to the Communications/Implementation Committee:

1. The revised Food Guide, based on a daily total diet approach, should include the four original food groups, plus an additional fats and sweets group.
2. Names of all five food groups should be re-examined.
3. The Base Food Guide should be adopted as the basis for modifying *Canada's Food Guide* to reflect a total diet approach. The number of servings for each food group, along with key nutrient criteria per serving, are as follows:
  - milk and milk products: 2 servings (each based on 300 mg calcium);
  - meat, fish, poultry and alternates: 3 servings (each supplying 12 g protein);
  - fruits and vegetables: 6 servings, of which at least 2 must be vegetables (each supplying 50 R.E. vitamin A, 12 mg vitamin C or 11 mcg folacin);
  - breads and cereals: 6 servings (each supplying 0.06 mg thiamin or 0.65 mg iron);
  - fats and sweets: the number of servings for an 1800 kcal (7600 kJ) diet should not exceed the *equivalent* of 20 mL (4 tsp) of fat and 40 mL (8 tsp) of sugar.
4. Adaptations to the Base Food Guide to satisfy the Nutrition Recommendations for various physiological groups should be expanded to form the basis for ranges in the number of servings.

5. The key messages of the Food Guide should encompass the concepts of energy balance, promoting growth in children, maintaining health and reducing the risk of chronic disease. They should stress daily variety within and among food groups.
6. Statements addressing water intake and alcohol consumption should be included in the revised Food Guide.
7. Further investigation of preschoolers' intakes should be undertaken in order for the Food Guide to encompass specific requirements based upon the dietary habits of this group.
8. Educational materials and programs should be developed for professionals, the food and food services industries and the public to facilitate adherence to the revised Food Guide. Such material should contain the rationale for changes in the Food Guide and outline adjustments required to permit occasional use of high-fat food items within the context of the Nutrition Recommendations.
9. The agricultural sector and the food and food services industries should be stimulated to respond to changes required in the food supply.

## 2.

# Introduction

In 1987, Health and Welfare Canada established two committees to revise the 1977 Nutrition Recommendations for Canadians to ensure that nutrition recommendations continue to promote and maintain health while reducing the risk of nutrition-related diseases. The Scientific Review Committee was charged with reviewing scientific evidence from the public health perspective and generating scientific statements on nutrition recommendations. Concurrently, the Communications/Implementation Committee was responsible for recommending the expression of the updated nutrition recommendations as dietary advice for the consumer and for identifying strategies for implementation.

As *Canada's Food Guide* is the key educational tool to assist Canadians to select foods that promote growth and development and maintain health, the Task Group for the Review of *Canada's Food Guide* was formed to review the Guide and to make recommendations to the Communications/Implementation Committee on revisions to it in the context of the updated Nutrition Recommendations.

The Technical Group for the Review of *Canada's Food Guide* was subsequently formed to investigate the impact of the recommendations of the Scientific Review Committee and those of the Task Group for the Review of *Canada's Food Guide* by assessing the nutritional adequacy of the Guide.

Members of the Technical Group were selected from governmental and non-governmental organizations on the basis of their expertise in the use of *Canada's Food Guide*, in nutrition programs at the provincial and community level and in computer applications.

Members of the Technical Group participated in four meetings, addressed their mandate and made recommendations. Close contacts were maintained with the Communications/Implementation Committee.





### 3.

## Methodology and Assessment

The Technical Group for the Review of *Canada's Food Guide* made recommendations to the Communications/Implementation Committee upon completion of the following:

- identification of the issues;
- solicitation and assessment of dietary records;
- analysis of meal patterns based on the 1988 Canadian Nutrient File;
- designation of food group categories;
- establishment of nutrient criteria for each group;
- establishment of food composites for each group;
- development of a base food guide; and
- adaptation of the Base Food Guide for various physiological groups.

### Identification of the Issues

In the course of fulfilling its mandate, the Technical Group reviewed key references appropriate to the development of the revised Food Guide (Health and Welfare Canada 1982; U.S.D.A. 1985).

The Technical Group also reviewed the Report of the Task Group for the Review of *Canada's Food Guide* and identified the specific recommendations therein that would guide the deliberations of the Technical Group. The detailed recommendations from the report which the Technical Group identified as pertinent to its work are presented in Appendix II.

From these recommendations, and in accordance with the mandate for the Technical Group, the total diet approach was a fundamental consideration in the assessments undertaken. The Technical Group was mindful of the additional criteria established by the Task Group for a revised food guide; namely, the continuation of a

daily food guide based on a food classification system, stressing a variety of accessible, affordable and acceptable foods. The Technical Group was also aware that the Task Group had identified the need for basing the recommended size and number of servings on the dietary practices of consumers.

The Technical Group agreed with the purpose and uses of the Guide as defined by the Task Group and with the need for consumer research and appropriate design and communication expertise in the visual development of *Canada's Food Guide*.

During its mandate, the Technical Group was provided with information regarding updated nutrition recommendations, which were being developed by the Scientific Review Committee. Specific nutrient recommendations as well as the criteria for energy sources (30% energy from total fat — with only 10% from saturates — 55% energy from carbohydrates and 15% energy from protein) and the recommendation for increasing dietary fibre were all considered by the Technical Group in their assessments.

### Discussion of Issues

The concept of a revised food guide that can be used in the selection of a total diet must be clearly defined. The Technical Group interpreted the total diet approach as one encompassing all food group categories, including fats and sweets, with a suggested range for the number of servings, and therefore a range of energy levels. The total diet approach is essential for the incorporation of the updated Nutrition Recommendations (which include the percentage of energy that Canadians should consume from total fat, saturated fat, carbohydrate and protein). The current food guide does not address "other" foods, such as fats and sweets, and can only be used as a foundation diet.

It was concluded that for the total diet approach, numbers of servings for various age and target groups should not be defined specifically; however, modifications should be made for preschoolers, pregnant and lactating women, and adolescents in order for them to meet their nutrient needs. If specific guides were developed for each age, sex and cultural group, it would defeat the purpose of keeping the guide simple. The Technical Group used this total diet approach to develop a base food guide.

#### **Goal of the Technical Group on Canada's Food Guide**

Once the issues were identified, the specific goal of the Technical Group, in accordance with its mandate, was to develop and technically assess, through computer application, a base food guide for Canada. This guide would include recommended serving sizes and numbers of food servings that would meet the Nutrition Recommendations.

### **Solicitation and Assessment of Dietary Records**

#### **Solicitation of Dietary Records**

To define serving sizes based on consumer dietary practices and to compensate for lack of current food consumption data for the total Canadian population, the Technical Group members solicited samples of recent dietary records, collected for other purposes across Canada, and reviewed them for sizes of servings. Several hundred records were shared from Prince Edward Island (seniors' residences), New Brunswick (men and women aged 19 to 74), Ottawa (men and women aged 20 to 75), Toronto (independent seniors), Manitoba (pregnant women), Calgary (preschoolers and adolescents), and British Columbia (adolescents, and adults aged 35 to 65). Although they are not recent, data from the Nutrition Canada Survey (1970-1972) were also examined.

#### **Assessment of Dietary Records**

Although the dietary records forwarded to the Technical Group had not been collected to assess serving sizes, the Technical Group used the records as a guide for this purpose. In their assessment of these dietary records, the Technical Group noted several key points.

The Nutrition Canada Survey results were found to be an unacceptable source of information, since serving sizes for some foods, such as milk, could not be interpreted. The solicited records on preschooler and adolescent intakes were also inappropriate for determining serving sizes.

The records from adults showed significant ranges in serving sizes. In general, these data showed that the majority of adults consumed, or reported that they consumed, 1 piece of (or 1/2 cup of) a vegetable or fruit, 1 cup milk (unless combined with cereal or other beverages), 2 slices of bread or the equivalent, and 3 to 4 ounces of meat, poultry or fish.

The data also showed that the Canadian pattern of eating is still that of three meals per day, and not that of several small meals, commonly referred to as "grazing". This is consistent with preliminary data from the Campbell's Survey on Well-Being in Canada 1988 (personal communication 1989), which shows that "grazing" is not a prevalent pattern of eating.

### **Analysis of Meal Patterns Based on 1988 Canadian Nutrient File**

As a further step in developing the Base Food Guide, the Technical Group analyzed current representative meal patterns for nutrient content and degree of compliance with updated Nutrition Recommendations, using the 1988 Canadian Nutrient File.

A 14-day Tufts' menu (Tufts University Diet and Nutrition Letter, 1988), designed for people with a healthy heart, met all the Nutrition Recommendations and provided an average 2030 kcal (8490 kJ) of energy — 29% from fat, 52% from carbohydrate, 21% from protein and 7% from saturated fats. (The total energy contribution

from macronutrients is greater than 100% due to the approximation of energy factors and rounding.) As this meal plan used low-fat, cholesterol-reduced products such as egg substitute, 1% milk, and low-calorie salad dressings, regular foods were substituted and the diet re-analyzed. From the analyses, it was apparent that although people could reduce total energy from fat to approximately 30% by consuming skim milk or special food products, the level of protein was greater than 15% and the carbohydrate level lower than 55%. Analyses showed that significant changes were required to bring the energy level below 2030 kcal (8490 kJ), which was that of the original menu plan.

In addition to Tufts' diet, five weeks of meal plans from a "weight-loss" program, based on the current food guide, were analyzed. Because many Canadians are on weight-reduction programs, it was interesting to see whether a low-calorie program would meet the revised Nutrition Recommendations. Although these diets met the criterion of 30% energy from fat, the percentage of protein was greater than 26%. The key nutrient in jeopardy in these diets was iron (approximately 70% of that recommended for premenopausal women).

## Designation of Food Groups

In keeping with the Task Group recommendations to classify food groups and use a total diet approach, it was necessary to reassess food groups. While the Technical Group concurs with the recommendation that consumer research be conducted, in the absence of this research, it classified foods on the basis of key nutrients supplied by each group in the current guide. As an educational tool, *Canada's Food Guide* is used to assist the public in making appropriate food choices to help ensure that their diet is nutritionally adequate. While the emphasis of the Guide is on food, nutrients must form the basis of the food groups if nutritional adequacy is to be considered.

To classify foods using a total diet approach, five food groups were deemed necessary. These five groups include the four groups in the present food guide, as well as a fifth group for foods that

provide mainly energy. For the purposes of this report, this fifth group has been named the Fats and Sweets group. The Technical Group considered it important that the names of the food groups be re-examined in light of the revised Nutrition Recommendations in order to reflect the desired characteristics of the Canadian diet, such as decreasing fat and increasing complex carbohydrate intakes. For example, because of the nutrient density of vegetables, these could be mentioned before fruits; that is, the Vegetable and Fruit group, and similarly, based on iron contribution to the diet, "Cereals" could precede "Breads". Also, "Milk and Milk Products" could be changed to "Milk, Yogurt and Cheese" to specify the milk products that meet the key nutrient criteria for this food group.

## Establishment of Nutrient Criteria

The Technical Group established criteria for key nutrients for four of the five food groups to determine which foods would be sources of these nutrients for each group. The criteria established for meats, fish, poultry and alternates and milk and milk products were similar to the criteria for *Canada's Food Guide*. For the Fruits and Vegetables and Breads and Cereals groups, the criteria for the key nutrients were set at 5%, with the exception of vitamin C, which was set at 30%. These last two criteria are similar to those recently established for nutrition labelling (Consumer and Corporate Affairs Canada, 1988). No criteria were established for the Fats and Sweets group — although this group provides some nutrients, foods in it mainly provide energy and add taste.

### Fruits and Vegetables

One serving of food recommended for inclusion in this group would provide one of the following:

- vitamin C — 30% of the revised Recommended Nutrient Intake for adult males (12 mg);
- vitamin A — 5% of the Recommended Nutrient Intake for adult males (50 R.E.); and
- folacin — 5% of the Recommended Nutrient Intake for adult males (11 mcg).



#### Breads and Cereals

One serving of food recommended for inclusion in this group would provide one of the following:

- thiamin — 5% of the Recommended Nutrient Intake for adult males (0.06 mg); and
- iron — 5% of the revised Recommended Nutrient Intake for adult women (0.65 mg).

#### Meat, Fish, Poultry and Alternates

One serving of food recommended for inclusion in this group would provide the following:

- protein — 20% of the protein recommended for adult males (12 g).

#### Milk and Milk Products

One serving of the foods in this group would provide the following:

- calcium — 300 mg, as supplied by 250 mL of milk. This would supply only 27% of the calcium recommended for adolescents.

### Establishment of Food Composites

To develop a base food guide to meet the updated Nutrition Recommendations, and to define serving sizes and number of servings of foods, food composites were established for each food group. To be included in a composite a food had to meet the following criteria:

- meet the established key nutrient criteria on a per serving basis for that food group;
- reflect current consumer food preference; and
- support the updated Nutrition Recommendations.

The nutrient content of the foods included in the composites was calculated using the 1988 Canadian Nutrient File as the database.

Because the current food guide specifies a minimal number of vegetable choices in the Fruits and Vegetables group, it was necessary to develop separate composites for these two categories of foods.

#### Fruits

In determining the composite for fruit, the Technical Group used 1986 Statistics Canada Family Food Expenditure data (Statistics Canada, 1989) and was guided by the Scientific Review Committee's recommendation for increased fibre in the diet.

Although many juices meet at least one of the nutrient criteria for this group, it was decided that only two servings should be included in the fruit composite. This decision was based upon the recommendation from the Scientific Review Committee to increase dietary fibre in the diet.

The nutrient content of one serving of the top ten fruits consumed in Canada, plus two servings of juice, were averaged for the composite (Appendix III).

The updated Nutrition Recommendations emphasize the need to increase dietary fibre. As this food group is a source of fibre, foods are listed in descending order of dietary fibre content in Appendix IV. Foods are grouped according to their ability or inability to meet at least one of the key nutrient criteria. They are also grouped and asterisked to indicate their rating under the nutrition-labelling criteria. This has been done to link the updated Nutrition Recommendations with the information consumers obtain from food package labels.

#### Vegetables

To calculate a food composite for vegetables, 1986 Statistics Canada data on Family Food Expenditure were used (Statistics Canada, 1989). Nutrient data for three servings of potatoes, one serving of the remaining nine top vegetables and tomatoes were averaged to reflect vegetable consumption in Canada (Appendix III).

The updated Nutrition Recommendations emphasize the need to increase dietary fibre. Because vegetables are a source of fibre, foods in this category are listed in descending order of dietary fibre content in Appendix IV. Foods in this group are categorized according to their ability or inability to meet at least one of the key nutrient criteria. They are also grouped and asterisked to



indicate their rating using the nutrition-labelling criteria. This has been done to link the updated Nutrition Recommendations with the information consumers obtain from food package labels.

### Breads and Cereals

Available data (Agriculture Canada, 1986; Statistics Canada, 1989) did not provide the details necessary for the Technical Group to develop the composite for this group based on food consumption and expenditure data. Although food disappearance data provide information on wheat flour purchased, it cannot give statistics on its use (Agriculture Canada, 1986). Data on the amounts of various breads consumed were available (personal communication, S. Kerr, Grocery Products Manufacturers of Canada), but the total amount consumed could not be related to the consumption of other foods in this group.

Due to lack of data, many breads, grains, pastas and cereals were included in the food composite (Appendix III) based on the expertise of the Technical Group. Whole-grain breads and cereals were used to increase dietary fibre consistent with the updated Nutrition Recommendations. Cereals were also included to ensure adequate iron intakes. Foods with high cholesterol and fat values, such as egg noodles, muffins, cakes and cookies, were not included in the composite.

The updated Nutrition Recommendations emphasize the need to increase dietary fibre. Because breads and cereals are a source of fibre, foods in this category are listed in descending order of dietary fibre content in Appendix IV. Fat and cholesterol values are also included to indicate those foods in which the levels of these nutrients are higher. Foods in this group are categorized according to their ability or inability to meet at least one of the key nutrient criteria. They are also grouped and asterisked to indicate their rating using the nutrition-labelling criteria. This has been done to link the updated Nutrition Recommendations with the information consumers obtain from food package labels.

### Meat, Fish, Poultry and Alternates

In determining the composite for the meat, fish, poultry and alternates group, the amounts of meat, fish, poultry, eggs, pulses and nuts currently consumed by Canadians were considered (Statistics Canada, 1989). The Technical Group was also guided by the Scientific Review Committee's recommendation to decrease saturated fat and increase dietary fibre in the diet. The food items selected for this group and the nutrient data for one serving of the composite are shown in Appendix III.

The updated Nutrition Recommendations emphasize the need to reduce total fat in the diet. Because the meat, fish, poultry and alternates group is a source of fat, foods in this category are listed in ascending order of fat content in Appendix IV. Cholesterol, sodium, iron and fibre values have been included to indicate which foods have higher levels of these nutrients. Foods are grouped according to their ability or inability to meet the key nutrient criterion.

### Milk and Milk Products

From data on 1986 Family Food Expenditure (Statistics Canada, 1989) proportionate amounts of fluid milk, cheese and yogurt were considered, and a composite of 75% fluid milk, and 25% milk products was developed (Appendix III). Two-percent milk was used for the fluid milk as it is the most common type of milk consumed (Statistics Canada, 1989).

An additional composite was produced substituting fluid skim milk for fluid 2% milk in order to illustrate the effect of food choices on dietary fat intake.

The choice of foods for this group is severely limited by the criterion for 300 mg calcium. The updated Nutrition Recommendations emphasize the need to decrease total fat in the diet. Because foods in this group are a source of fat, they are listed in ascending order of fat content in Appendix IV. Cholesterol and sodium values are also included to indicate those foods with higher levels of these nutrients. Foods are grouped according to their ability or inability to meet the key nutrient criterion. They are also grouped and

asterisked to indicate their rating using the nutrition-labelling criteria. This has been done to link the updated Nutrition Recommendations with the information consumers obtain from food package labels.

#### Fats and Sweets

From disappearance data on sugar, fats and oils, it appears that the amount of sugar consumed per capita (117.8 g per day) is approximately twice that of fats and oils, which is 62 g per person, per day (Agriculture Canada, 1986). It was decided that white sugar should represent the sweets, since it is the main ingredient in all foods in this category.

Calculations for the fat composite were based on 1986 Family Food Expenditures Survey data which showed that approximately one-third of the fat consumed is from animal sources, and two-thirds from vegetable sources (Statistics Canada, 1989). Appendix III lists the fat sources and amounts used for the composite.

An additional fat composite was developed using only vegetable oils and margarine to illustrate the effect of food choices on dietary cholesterol intake.

#### Development of a Base Food Guide

The Technical Group designed a base food guide using the food composites to define the nutrient data for one serving of each food group. The average Canadian nutrient values for each food composite were loaded into an interactive dietary analysis program (Diet Analyzer, The CBORD Group, Ithaca, N.Y.) and were then assessed.

#### Definition of Number and Sizes of Servings

The Technical Group developed a base food guide of approximately 1800 kcal (7600 kJ) of energy. This energy level is consistent with energy recommendations for the majority of Canadians over four years of age. Below the 1800 kcal (7600 kJ) level, it becomes increasingly difficult for Canadians over four years to meet the Recommended Nutrient Intakes.

The Technical Group determined that the following number and size of servings from each group should be used for the Base Food Guide. These servings may be subdivided and distributed among eating occasions.

- fruits and vegetables (6 servings, of which at least 2 must be vegetables): To meet at least one of the nutrient criteria established by the Technical Group, 125 mL (1/2 cup) of most vegetables or fruits, or 1 medium vegetable or fruit, is sufficient. Exceptions to this include celery (250 mL, or 1 cup), cucumber (250 mL, or 1 cup), apples (2) and plums (2). It should be noted that although juices provide the key nutrients, they are low in fibre (Appendix IV).
- breads and cereals (6 servings): Examples of one serving are 1 slice of bread, 125 mL (1/2 cup) rice or enriched pasta and approximately 30 g (1 oz) ready-to-eat cereal (Appendix IV). Whole-grain and bran products are major contributors of dietary fibre. As shown in Appendix IV, some foods in this group, such as egg noodles, muffins, cakes and cookies, contribute to fat and cholesterol intake.
- meat, fish, poultry and alternates (3 servings, based on 12 g protein per serving): Examples of one serving include 60 g (2 oz) cooked, lean meat, fish, or poultry; 250 mL (1 cup) cooked, dried peas, beans or lentils; 125 mL (1/2 cup) nuts or seeds; 60 g (2 oz) cheese; and 125 mL (1/2 cup) cottage cheese. One egg or 25 mL (5 tsp) of peanut butter may be used as one-half servings (Appendix IV). It should be noted that although this may appear to be an increase from the number of servings in *Canada's Food Guide*, the size of each serving has been limited to 60 g (2 oz) lean meat, fish or poultry. This was necessary in order to meet the recommendation for 15% energy from protein and 30% from fat, while still considering the Recommended Nutrient Intake for iron. The quantity of 180 g (6 oz) may be distributed among eating occasions.

- milk and milk products (2 servings, each based on 300 mg calcium): One additional serving would be required for pregnant and lactating women. In addition, one additional serving is strongly suggested for adolescents who are not meeting their energy requirements from a variety of foods. Examples of serving sizes that meet the nutrient criterion of 300 mg calcium are 250 mL (1 cup) milk, 175 mL (3/4 cup) yogurt, and 45 g (1 1/2 oz) cheese (Appendix IV).
- fats and sweets: A statement such as "The number of servings for an 1800 kcal (7600 kJ) diet should not exceed the *equivalent* of 20 mL (4 tsp) of fat and 40 mL (8 tsp) sugar" would be more appropriate than specific statements in light of the recommendations to reduce fat and balance energy intake. This general statement would allow foods containing fat and/or sugar to be identified in educational materials, and equivalents of food servings provided.

In summary, for the Base Food Guide, the following number of servings (based on the composites) were used: 2 servings of milk and milk products; 3 of meat, fish, poultry and alternates; 3 of vegetables; 3 of fruits; 6 of breads and cereals; 4 of fat; and 8 of sugar.

Table I illustrates the nutrients provided by each food group, based on the composites, and the total nutrients in the Base Food Guide. Recommended Nutrient Intakes for adult males (with the exception of iron, which is shown for premenopausal women) are also indicated.

Table I. Nutrients Provided in the Base Food Guide

Nutrient	Unit	Nutrient value per composite							Total	RNIs*
		Milk (2)**	Meat (3)	Veg. (3)	Fruit (3)	Bread (6)	Fat (4)	Sugar (8)		
Energy	kcal	266	456	144	216	474	148	128	1832	
	kJ	1113	1908	602	904	1983	619	536	7665	
Protein	g	18.5	44.4	4.2	2.4	15.0			84.5	61.0
Fat	g	12.6	25.2	0.6	0.9	4.8	16.4		60.5	
Carbohydrates	g	19.7	12.0	32.7	54.6	96.6		33.6	249.2	
Cholesterol	mg	46	212			3	14		275	
SFA	g	7.9	8.5	0.1	0.2	0.9	4.6		22.2	
PUFA	g	0.4	3.4	0.3	0.2	1.3	4.4		10.0	
MUFA	g	3.6	10.3	0.1	0.18	1.8	6.9		22.9	
Dietary fibre	g		1.8	4.8	5.4	8.4			20.4	
Calcium	mg	636	108	69	45	96	4		958	800.0
Phosphorus	mg	502	432	102	48	354	4		1442	800.0
Iron	mg	0.3	3.7	1.3	1.0	6.2			12.5	13.0*
Magnesium	mg	60.1	64.8	54.6	36.0	55.2	0.4		241.1	250.0
Zinc***	mg	2.3	5.0	0.7	0.3	1.1			9.4	12.0
Sodium	mg	368	528	1	239	876	124		2028	
Potassium	mg	647	684	732	708	378	4		3153	
Vit. A	R.E.	270	60	534	150		116		1130	1000.0
Vit. C	mg	4	0	42	87				133	40.0
Thiamin	mg	0.16	0.36	0.18	0.15	0.84			1.7	1.2
Riboflavin	mg	0.73	0.36	0.12	0.15	0.30			1.7	1.5
Niacin	N.E.	4.6	18.6	3.0	1.5	8.4			36.1	22.0
Pyridoxine	mg	0.18	0.54	0.48	0.36	0.36			1.9	0.9
Folacin	mcg	23.1	79.2	63.3	47.1	64.8	0.4		278	220.0
Vit. B12	mcg	1.66	2.28						3.9	2.0

% energy from fat: 30%

% energy from protein: 18%

% energy from carbohydrate: 54%

% energy from saturates: 11%

(Total higher than 100% due to approximation of energy factors and rounding.)

\* Recommended Nutrient Intakes (updated RNIs) expressed are for adult males, with the exception of iron, which is for premenopausal women.

\*\* Number of servings in the Base Food Guide.

\*\*\* Data for zinc was missing in nutrient database.

From this table, using the Atwater energy conversion factors of 4 kcal/g (17 kJ/g) for protein and carbohydrate and 9 kcal/g (37 kJ/g) for fat, it can be seen that approximately 30% of the energy is derived from fat, 54% from carbohydrates and 18% from protein. Saturated fats supply approximately 11% of the energy. The total energy contribution from macronutrients may be greater than 100%, due to the approximation of energy factors and rounding. The Recommended Nutrient Intakes for adults are met in the Base Food Guide, with the exception of iron and zinc. The iron content is within 4% of that recommended for premenopausal women. The low levels of zinc can be attributed to missing data in the nutrient database. Even so, 80% of the zinc requirement for adult males has been attained.

## Adaptation of the Base Food Guide for Various Groups

The number of servings of each food group in the Base Food Guide were modified in order to show how various groups, such as adolescents, pregnant and lactating women, the elderly, dieters and men in high-risk age groups (ages 25 to 49) for heart problems might meet their particular nutrient requirements.

These examples could form the basis for ranges in the number of servings recommended in the revised Food Guide. For the sake of simplicity, specific numbers of servings for various age or target groups should not be stated in the Food Guide. Several examples are given for each food group, showing that some flexibility is possible.

Tables IIA, B, and C illustrate the following:

- As energy requirements surpass the 1800 kcal (7600 kJ) level, the number of additional servings for any one food group is related to the number of servings from other food groups. This may be seen in the adolescent diet (Table IIA), where calcium requirements can be met with two servings of milk by varying the number of servings from the fruits and vegetables or breads and cereals groups. This allows for greater flexibility in food choices.

Cholesterol levels in high-energy diets for adolescents can be lowered by using skim milk and margarine.

- Low-energy diets for elderly women (aged 75 and over) met all requirements, with the exception of the percentage of energy from saturated fat (Table IIB). As energy levels decrease, skim milk should be substituted for 2% milk in order to reduce saturated fat to 10% of total energy.



**Table II. Adaptations to the Base Food Guide for Various Physiological Groups****A. Examples for male adolescents (16 to 18 years)**

Food Group	Number of Servings				
Milk and milk products	3	3	4	2	3*
Meat, fish, poultry and alternates	4	4	4	4	4
Vegetables	5	4	5	5	5
Fruits	5	4	5	5	5
Breads and cereals	11	12	10	12	12
Fats	10	11	10	11	11*
Sweets	20	22	20	22	22
<b>Energy level and cholesterol content</b>					
Total energy (kcal)	3 166	3 194	3 220	3 181	3 217
(kj)	113 247	13 364	13 472	13 309	13 460
% energy from protein	16	16	15	16	16
% energy from fat	30	31	31	29	28
% energy from carbohydrates	57	56	55	59	60
% energy from saturates	10	11	11	10	7
cholesterol (mg)	392	396	415	374	325

\* Sample using skim milk composite and fat composite with no butter.

**B. Examples for females**

Food Group	Number of Servings			
	Females 75+	Dieters	Pregnant/ Lactating	
Milk and milk products	2	2*	2	2*
Meat, fish, poultry and alternates	2	2	3	3
Vegetables	2	2	4	4
Fruits	2	2	2	2
Breads and cereals	5	4	5	5
Fats	3	5*	0	0
Sweets	6	10	0	0
<b>Energy level and cholesterol content</b>				
Total energy (kcal)	1 412	1 409	1 453	1 396
(kj)	5 908	5 895	6 079	5 841
% energy from protein	18	18	23	24
% energy from fat	30	30	27	24
% energy from carbohydrates	54	55	53	55
% energy from saturates	11	8	11	9
cholesterol (mg)	200	167	261	239
Limiting nutrients			Iron	Iron
			88%	88%
				Iron and Folacin**

\* Sample using skim milk composite and fat composite with no butter.

\*\* For pregnant women, 59% of the iron requirement (26 mg) and 73% of the folacin requirement (475 mcg) would be supplied by this diet.

**Table II (cont). Adaptations to the Base Food Guide for Various Physiological Groups**

C. Examples for males (25 to 49 years)

Food Group	Number of Servings		
Milk and milk products	2	2*	2
Meat, fish, poultry and alternates	4	4	3
Vegetables	5	5	5
Fruits	5	5	5
Breads and cereals	8	8	9
Fats	8	10*	10
Sweets	16	20	20
<b>Energy level and cholesterol content</b>			
Total energy (kcal)	2 658	2 729	2 723
(kJ)	11 121	11 418	11 393
% energy from protein	16	16	14
% energy from fat	30	29	29
% energy from carbohydrates	57	58	60
% energy from saturates	10	7	10
cholesterol (mg)	361	311	298

\* Sample using skim milk composite and fat composite with no butter.

- For premenopausal women who are limiting energy intakes (dieters), an intake of 1400 kcal (5900 kJ) met all requirements except that for iron (88% of recommended intake). This was done by modifying the number of servings in the Base Food Guide (Table I) — vegetables were increased, fruits and breads and cereals were decreased, and fats and sweets eliminated (Table IIB). A further reduction in energy intake may be made by careful choice of foods.
- Pregnant and lactating women need three servings of milk to meet their calcium requirements (Table IIB). They can reduce their cholesterol intake by substituting margarine for butter. If this change were made, cholesterol would decrease to 285 mg from the 306 mg shown in the table.
- Males in the high-risk age groups for heart problems (25 to 49 years) need approximately 2700 kcal (11300 kJ) of energy daily. However, they must either consume skim milk and margarine, instead of 2% milk and butter, or reduce their consumption of meat to bring their cholesterol intake down to approximately 300 mg (Table IIC).

Although the percentage of energy from protein is below 15% when only three servings of meat are included, the amount of protein in the diet (94 g) is higher than the specific requirement for this nutrient (61 g).

The Technical Group developed a one-day menu to illustrate adaptations that might be made both in types of foods and in serving sizes to accommodate 1800 kcal (7600 kJ), 2700 kcal (11300 kJ) and 3200 kcal (13400 kJ) diets (Table III). These menus demonstrate how adolescents consuming 3200 kcal (13400 kJ) of energy daily can include fast foods such as hamburgers, french fries and regular cola beverages in their diets and how males in the high-risk age groups for heart problems (25 to 49 years) consuming 2700 kcal (11300 kJ) per day can consume 240 g (8 oz) meat daily by making skim milk and margarine part of their diet. There are slight variations in the quantity of energy provided; percentages of energy from protein, total fat, saturated fat and carbohydrates; and in cholesterol when specific foods, rather than composites, are used.

Table III. Sample Menu for Three Different Energy Levels

1800 kcal (7 600 kJ)		2700 kcal (11 300 kJ)		3200 kcal (13 400 kJ)	
<b>Breakfast</b>					
juice	1 frt	juice	1 frt	juice	1 frt
cereal (30g)	1 brd	cereal (30 g)	1 brd	cereal (30 g)	1 brd
		sugar (10 mL)	2 swt	sugar (10 mL)	2 swt
milk (250 mL)	1 milk	skim milk (250 mL)	1 milk	milk (250 mL)	1 milk
toast (1 sl)	1 brd	toast (2 sl)	2 brd	toast (2 sl)	2 brd
butter (5 mL)	1 fat	margarine (10 mL)	2 fat	butter (10 mL)	2 fat
jam (5 mL)	1 swt	jam (10 mL)	2 swt	jam (10 mL)	2 swt
<b>Snack</b>					
		orange	1 frt	orange	1 frt
				muffin (60 g)	1 brd
					1 fat
					2 swt
<b>Lunch</b>					
2 sandwiches	4 brd	2 sandwiches	4 brd	2 sandwiches	4 brd
(w 60 g meat)	1 mt	(w 90 g meat)	1.5 mt	(w 60 g meat)	1 mt
(w 5 mL fat)	1 fat	(w 10 mL marg.)	2 fat		
		(w tomato)	1 veg		
		(w 20 mL dress.)	2 fat		
banana	1 frt	banana	1 frt	banana	1 frt
		reg. cola	7 swt	reg. cola	7 swt
<b>Snack</b>					
angel food cake	7 swt	angel food cake	7 swt	hamburger	1.5 mt
				(w 90 g meat)	2 brd
				french fries	1 veg
					4 fat
				reg. cola	7 swt
		apple	.5 frt	apple	.5 frt
<b>Dinner</b>					
meat (120 g)	2 mt	meat (150 g)	2.5 mt	meat (90 g)	1.5 mt
potato (125 mL)	1 veg	potato (250 mL)	2 veg	potato (250 mL)	2 veg
		margarine (10 mL)	2 fat	butter (5 mL)	1 fat
peas/carrots	1 veg	peas/carrots	1 veg	peas/carrots	1 veg
lettuce (250 mL)	1 veg	lettuce	1 veg	lettuce	1 veg
dressing(20 mL)	2 fat	dressing (20 mL)	2 fat	dressing (20 mL)	2 fat
peach	1 frt	peach	1 frt	peach	1 frt
		(w 10 mL sugar)	2 swt		
				milk (250 mL)	1 milk
<b>Snack</b>					
milk (250 mL)	1 milk	skim milk	1 milk	milk	1 milk
		cereal	1 brd	cereal	1 brd
		apple	.5 frt	apple	.5 frt

## 4. Discussion

For a food guide to be accepted, the public must be able to understand and use it. In terms of a revised food guide, this means that a number of factors must be considered in communicating the key nutrition messages. To reflect the recommendations of the Scientific Review Committee, the concept of energy balance and a motivating message that promotes growth in children, the maintenance of health and the reduction of the risk of chronic disease should be included. In addition, daily food choices and variety within and among food groups should be stressed. These were the underlying principles used by the Technical Group in the development of food composites and the Base Food Guide.

The Technical Group developed a base food guide of approximately 1800 kcal (7600 kJ). This energy level is consistent with energy recommendations for the majority of Canadians over four years of age. Below the 1800 kcal (7600 kJ) level, it becomes increasingly difficult for Canadians over four years to meet the Recommended Nutrient Intakes.

The Nutrition Recommendations addressing the fat content of the diet (that is, 30% of energy from total fat and 10% from saturates), with the accompanying reduction in cholesterol, placed restrictions on the selection of foods for the composites. Only lean cuts of meat, skim or 2% milk, and low-fat yogurt were included, whereas luncheon meats, sausages, pastries, cookies, desserts (including ice cream and puddings) and fried foods were completely excluded. For example, a 60 g muffin was excluded from the breads and cereals composite because it contained 6 g fat and 62 mg of cholesterol. Egg noodles, also excluded from the composite, contain 52 mg cholesterol per 250 mL serving. (Pasta does not contain any cholesterol.) If people include these foods in their diets, they will have to adjust the number of servings they consume from the Fats and Sweets group.

In addition to fat and cholesterol, iron played a significant role in determining both the foods included in the composites and the number of servings in the Base Food Guide for the meat, fish, poultry and alternates group and the breads and cereals group. Considering current levels of iron fortification, it was necessary to stress iron-rich foods in both composites. The number of servings required from these groups to meet the iron recommendations meant that, at the 1800 kcal (7600 kJ) energy level, energy from protein could not be limited to 15%. Requirements for other nutrients could be met at energy levels below that of 1800 kcal (7600 kJ).

In developing the composites and the Base Food Guide, the Technical Group also considered dietary fibre and complex carbohydrates. However, these issues were not fully addressed, because no specific levels for dietary intake have been defined. As sources of energy, either breads and cereals or fruits and vegetables may be increased in order to increase energy, complex carbohydrate and dietary fibre intakes. However, the cost and availability of various foods may be important factors in making food choices.

In the course of its deliberations, the Technical Group recognized the importance of including statements in the Food Guide on water intake and alcohol consumption.

The work of the Technical Group was subject to certain limitations. Data on current food consumption patterns and nutrient intakes are lacking, since no studies for the total Canadian population have been undertaken since the Nutrition Canada Survey of 1970-1972.

Adaptations to the revised Food Guide for preschoolers require further investigation. Smaller servings for this group were noted by the Technical Group in its assessment of food records; however, the issue was not addressed by this committee.

The modification of *Canada's Food Guide* will entail revisions to publications and may require amendments to legislation which refers to the current Food Guide.

The Technical Group realized, however, that the total impact of revisions to the Guide must still be considered. Canadians will have to make significant changes in their eating habits in order to meet the Nutrition Recommendations. A major educational campaign will have to be initiated to facilitate adherence to the revised Food Guide. Special educational material must be developed for many groups, including professionals, the food and food services industry and the public. These materials should state the rationale for changes to *Canada's Food Guide* and outline dietary adjustments required to permit occasional use of higher-fat food items within the context of the Nutrition Recommendations.

The Technical Group recognized that changes in the Canadian food supply will also be required if the public is to follow the Nutrition Recommendations — for example, the fat and sodium content of foods could be reduced. The agricultural sector and the food and food services industry will have to respond to these needs. The impact of recommended dietary changes on food costs was not examined in this report.



## 5.

## Conclusions and Recommendations

As previously stated, the goal of the Technical Group for the Review of *Canada's Food Guide* was to technically assess the feasibility of developing a food guide with a total diet approach including serving sizes and number of food servings, that would meet the revised Nutrition Recommendations.

The Technical Group was guided in its task by the Report of the Task Group for the Review of *Canada's Food Guide*; *Canada's Food Guide* and its basis; consumer practices; current food consumption data; and the recommendations of the Scientific Review Committee.

Despite limited data on current food consumption patterns and nutrient consumption of Canadians, the Technical Group was able to develop a base food guide that would follow the updated Nutrition Recommendations.

In conclusion, the Technical Group recommends that:

1. The revised Food Guide, based on a daily total diet approach, should include the four original food groups, plus an additional fats and sweets group.
2. Names of all five food groups should be re-examined.
3. The Base Food Guide should be adopted as the basis for modifying *Canada's Food Guide* using a total diet approach. The number of servings for each food group, along with key nutrient criteria per serving, are as follows:
  - fruits and vegetables: 6 servings, of which at least 2 must be vegetables (each supplying 50 R.E. vitamin A, 12 mg vitamin C or 11 mcg folacin);

- breads and cereals: 6 servings (each supplying 0.06 mg thiamin or 0.65 mg iron);
- meat, fish, poultry and alternates: 3 servings (each supplying 12 g protein);
- milk and milk products: 2 servings (each based on 300 mg calcium);
- fats and sweets: the number of servings for an 1800 kcal (7600 kJ) diet should not exceed the *equivalent* of 20 mL (4 tsp) of fat and 40 mL (8 tsp) of sugar.

4. Adaptations to the Base Food Guide to satisfy the Nutrition Recommendations for various physiological groups should be expanded to form the basis for ranges in the number of servings.
5. The key messages of the Food Guide should encompass the concepts of energy balance, promoting growth in children, maintaining health and reducing the risk of chronic disease. They should stress daily variety within and among food groups.
6. Statements addressing water intake and alcohol consumption should be included in the revised Food Guide.
7. Further investigation of preschoolers' intakes should be undertaken in order for the Food Guide to encompass specific requirements based upon the dietary habits of this group.

## 5. Conclusions and Recommendations

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8. Educational materials and programs should be developed for professionals, the food and food services industries and the public, to facilitate adherence to the revised Food Guide. Such material should contain the rationale for changes in the Food Guide and outline adjustments required to permit occasional use of high-fat food items within the context of the Nutrition Recommendations.
9. The agricultural sector and the food and food services industries should be stimulated to respond to changes required in the food supply.

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# Appendix I

## Technical Group for the Review of Canada's Food Guide

### Terms of Reference

#### Mandate

To provide support to the Communications/Implementation Committee in recommending the expression of updated nutrition recommendations as dietary advice for the consumer by:

1. reviewing the report of the Task Group on *Canada's Food Guide*;
2. examining specified recommendations from the Task Group report through the following:
  - assessment, by computer analysis, of nutritional adequacy of *Canada's Food Guide* as per recommended revisions,
  - assessment of impact of shift to total diet approach,
  - definition of serving sizes and number of servings of foods,
  - definition of message(s) for a revised *Canada's Food Guide*;
3. identifying the impact of revisions to *Canada's Food Guide* at provincial, regional and community levels; and
4. preparing progress reports and a final report, including recommendations, for submission to the Communications/Implementation Committee.

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# Appendix II

## Selected Recommendations from the Report of Task Group on the Review of Canada's Food Guide

Recommendations related to the development of a food guidance system:

1. *Canada's Food Guide* should be based on a total diet approach that promotes dietary adequacy while integrating the most current Nutrition Recommendations.
2. The statement of purpose for *Canada's Food Guide* should read: "*Canada's Food Guide* is a realistic framework to assist healthy Canadians over two years of age in selecting foods to promote dietary adequacy."
3. *Canada's Food Guide* may be used:
  - for planning and selecting foods to promote health maintenance and risk reduction of chronic diet-related diseases among healthy Canadians over two years of age; and
  - as an educational tool targeted to the needs of specific groups.
4. To ensure widespread use of the Food Guide, foods contained in it should be readily accessible, affordable and acceptable to consumers. A variety of foods should be displayed within each food group to promote maximum acceptability of the Guide.
5. *Canada's Food Guide* should retain a food group classification system that considers the four current food groups and emphasizes foods that best meet up-to-date nutrition recommendations. Consumer research should be done on the following:
  - What classification criteria should be used to classify foods in the Guide?
  - How valid is the Guide in suggesting food selections that promote dietary adequacy for each age and physiological group?

- How can convenience foods, mixed foods, and foods consumed away from home be classified in the Guide?
6. Recommended serving sizes in the context of the total diet approach of *Canada's Food Guide* should be based on consumer dietary practices. The number of servings should be determined according to the Recommended Nutrient Intakes for Canadians and the revised Nutrition Recommendations. It may be necessary to modify serving sizes or numbers to meet the nutritional needs of some users. For example, serving sizes for children should be smaller while the number of recommended servings for pregnant and lactating women should be greater.
  7. *Canada's Food Guide* should continue to base its suggestions on a daily food intake. The Guide should contain a note stating that day-to-day variations in intakes are normal and not harmful.
  8. Foods in *Canada's Food Guide* should not be limited to those produced locally, in order to maintain the greatest possible variety within the Guide and to minimize unrealistic changes in dietary habits.

Recommendation related to the implementation of a food guidance system:

1. In order to determine an effective visual presentation for *Canada's Food Guide*, consumer research should be done and appropriate design and communication expertise sought. The design chosen should be simple, clear and adaptable and the text positive, straightforward and comprehensible.



## Appendix III

### Food Composites

The steps for establishing the food composites are described in the text (Section 3). The following charts show the amounts and types of foods included in each composite and the nutrient data for one serving of each food composite.

#### Fruit Group

Foods and amounts used in composite (12 servings):

<i>Foods</i>	<i>Amount</i>	<i>Servings</i>
Apples (raw)	2*	1
Banana (raw)	1	1
Oranges (raw)	1	1
Grapefruit, white, all areas (raw)	1/2	1
Grapes, adherent skin, (raw)	25*	1
Melon, cantaloupe, (raw)	1/4*	1
Peaches, canned, light syrup	125 mL	1
Strawberries, frozen, unsweetened	125 mL	1
Pears, canned, juice packed	125 mL	1
Plums, raw	2*	1
Orange juice, froz. conc., diluted	125 mL	1
Apple juice, canned, with added Vit. C	125 mL	<u>1</u>
		12

\* Amounts necessary to meet at least one of the nutrient criteria.

Average nutrients provided by one serving of the fruit composite:

Energy	72.0 kcal
	299 kJ
Protein	0.8 g
Fat	0.3 g
Carbohydrates	18.2 g
Cholesterol	0 mg
SFA	0.06 g
PUFA	0.08 g
MUFA	0.06 g
Dietary fibre	1.8 g
Calcium	15 mg
Phosphorus	16 mg
Iron	0.32 mg

## Fruit Group (continued)

Magnesium	12.0	mg
Zinc	0.11	mg
Sodium	3	mg
Potassium	236	mg
Vit. A	50	R.E.
Vit. C	29	mg
Thiamin	0.05	mg
Riboflavin	0.05	mg
Niacin	0.5	N.E.
Pyridoxine	0.12	mg
Folacin	15.7	mcg
Vit. B12	0	mcg

## Vegetable Group

Foods and amounts used in composite (13 servings):

<i>Foods</i>	<i>Amount</i>	<i>Servings</i>
Potato (boiled, cooked without skin)	3	3
Lettuce (raw)	125 mL	1
Corn (canned, vacuum-packed)	125 mL	1
Cucumber (raw)	250 mL*	1
Carrots (cooked, boiled, drained)	125 mL	1
Onions (boiled, drained)	125 mL	1
Celery (raw)	250 mL*	1
Cabbage (boiled, drained)	125 mL	1
Cauliflower (boiled, drained)	125 mL	1
Broccoli (boiled, drained)	125 mL	1
Tomatoes (red, ripe, raw)	1	<u>1</u>
		13

\* Amounts necessary to meet at least one of the nutrient criteria.

Average nutrients provided by one serving of the vegetable composite:

Energy	48.0	kcal
	201	kJ
Protein	1.4	g
Fat	0.2	g
Carbohydrates	10.9	g
Cholesterol	0	mg
SFA	0.03	g
PUFA	0.09	g
MUFA	0.02	g
Dietary fibre	1.6	g
Calcium	23	mg



**Vegetable Group** (*continued*)

Phosphorus	34	mg
Iron	0.42	mg
Magnesium	18.2	mg
Zinc	0.24	mg
Sodium	41	mg
Potassium	244	mg
Vit. A	178	R.E.
Vit. C	14	mg
Thiamin	0.06	mg
Riboflavin	0.04	mg
Niacin	1.0	N.E.
Pyridoxine	0.16	mg
Folacin	21.1	mcg
Vit. B12	0	mcg

**Breads and Cereals Group**

Foods and amounts used in composite (5 servings):

<i>Foods</i>	<i>Amount</i>	<i>Servings</i>
Bread, whole-wheat	2 slices	2
Hamburger bun	1/4	0.5
Soda crackers	2 1/2	0.5
Rice	60 mL	0.5
Enriched spaghetti	60 mL	0.5
Cereal		
Oatmeal	31.25 mL	0.25
Shredded Wheat	1/4 biscuit	0.25
Bran Flakes	7.5 g	0.25
Wheat Flakes	7.5 g	0.25
		<u>5.0</u>

Average nutrients provided by one serving of the breads and cereals composite:

Energy	79	kcal
	331	kJ
Protein	2.5	g
Fat	0.8	g
Carbohydrates	16.1	g
Cholesterol	0.5	mg
SFA	0.15	g
PUFA	0.2	g
MUFA	0.3	g
Dietary fibre	1.4	g
Calcium	16	mg

## Breads and Cereals Group *(continued)*

Phosphorus	59	mg
Iron	1.03	mg
Magnesium	9.2	mg
Zinc	0.18	mg
Sodium	146	mg
Potassium	63	mg
Vit. A	0	R.E.
Vit. C	0	mg
Thiamin	0.14	mg
Riboflavin	0.05	mg
Niacin	1.4	N.E.
Pyridoxine	0.06	mg
Folacin	10.8	mcg
Vit. B12	0	mcg

## Meat, Poultry, Fish and Alternates Group

Foods and amounts used in composite (7 servings):

<i>Foods</i>	<i>Amount</i>	<i>Servings</i>
Beef, lean, ground	120 g	2
Pork		
Fresh pork	30 g	0.5
Ham	30 g	0.5
Fish		
Tuna	30 g	0.5
Bluefish	30 g	0.5
Chicken	60 g	1
Egg	1	0.5
Pulses		
Kidney beans	45 g	0.25
White beans	45 g	0.25
Peanut butter	25 mL	0.5
Cheese		
Cheddar	15 g	0.25
Cottage cheese	30 g	0.25
		<u>7.0</u>

Average nutrients provided by one serving of the composite:

Energy	152	kcal
	636	kJ
Protein	14.8	g
Fat	8.4	g
Carbohydrates	4.0	g

**Meat, Poultry, Fish and Alternates Group** (*continued*)

Cholesterol	70.8	mg
SFA	2.8	g
PUFA	1.2	g
MUFA	3.4	g
Dietary fibre	0.6	g
Calcium	36	mg
Phosphorus	144	mg
Iron	1.24	mg
Magnesium	21.6	mg
Zinc	1.68	mg
Sodium	176	mg
Potassium	228	mg
Vit. A	20	R.E.
Vit. C	0	mg
Thiamin	0.12	mg
Riboflavin	0.12	mg
Niacin	6.2	N.E.
Pyridoxine	0.18	mg
Folacin	26.4	mcg
Vit. B12	0.76	mcg

**Milk and Milk Products Group (2% milk)**

Foods and amounts used in composite (2 servings):

<i>Foods</i>	<i>Amount</i>	<i>Servings</i>
Milk, 2%	375 mL	1.5
Cheese		
Cheddar	6.67 g	0.148
Partly skimmed Mozzarella	6.67 g	0.148
Processed Swiss	6.67 g	0.148
Yogurt, plain, 1.55% BF	9.72 mL	<u>0.056</u>
		2.0

Average nutrients provided by one serving of the composite:

Energy	133	kcal
	556	kJ
Protein	9.2	g
Fat	6.3	g
Carbohydrates	9.8	g
Cholesterol	23	mg
SFA	3.96	g
PUFA	0.21	g
MUFA	1.8	g

**Milk and Milk Products Group (2% milk) (continued)**

Dietary fibre	0	g
Calcium	318	mg
Phosphorus	251	mg
Iron	15	mg
Magnesium	30.0	mg
Zinc	1.12	mg
Sodium	184	mg
Potassium	323	mg
Vit. A	135	R.E.
Vit. C	2	mg
Thiamin	0.08	mg
Riboflavin	37	mg
Niacin	2.3	N.E.
Pyridoxine	0.09	mg
Folacin	11.5	mcg
Vit. B12	0.83	mcg

**Milk and Milk Products Group (skim milk)**

Foods and amounts used in composite (2 servings):

<i>Foods</i>	<i>Amount</i>	<i>Servings</i>
Milk, skim	375 mL	1.5
Cheese		
Cheddar	6.67 g	0.148
Partly skimmed Mozzarella	6.67 g	0.148
Processed Swiss	6.67 g	0.148
Yogurt, plain, 1.55% BF	9.72 mL	0.056
		<u>2.0</u>

Average nutrients provided by one serving of the composite:

Energy	105	kcal
	438	kJ
Protein	9.4	g
Fat	2.9	g
Carbohydrates	10.3	g
Cholesterol	12	mg
SFA	1.88	g
PUFA	0.08	g
MUFA	0.8	g
Dietary fibre	0	g
Calcium	323	mg
Phosphorous	263	mg
Iron	0.13	mg

**Milk and Milk Products Group (skim milk) (continued)**

Magnesium	25.7	mg
Zinc	1.15	mg
Sodium	187	mg
Potassium	346	mg
Vit. A	143	R.E.
Vit. C	2	mg
Thiamin	0.07	mg
Riboflavin	0.32	mg
Niacin	2.4	N.E.
Pyridoxine	0.09	mg
Folacin	11.8	mcg
Vit. B12	0.86	mcg

**Fats (including butter)**

Food and amounts used in composite (3 servings):

<i>Foods</i>	<i>Amount</i>	<i>Servings</i>
Butter	5 mL	1
Margarine (with fatty-acid declaration)	5 mL	1
Canola oil	5 mL	$\frac{1}{3}$

Average nutrients provided by one serving of the composite:

Energy	37 kcal
	155 kJ
Protein	0.0 g
Fat	4.1 g
Carbohydrates	0.0 g
Cholesterol	3.5 mg
SFA	1.15 g
PUFA	1.10 g
MUFA	1.7 g
Dietary fibre	0 g
Calcium	1 g
Phosphorus	1 mg
Iron	0.0 mg
Magnesium	0.1 mg
Zinc	0.0 mg
Sodium	31 mg
Potassium	1 mg
Vit. A	29 R.E.
Vit. C	0 mg
Thiamin	0.0 mg



## Fats (including butter) (continued)

Riboflavin	0.0	mg
Niacin	0.0	N.E.
Pyridoxine	0.0	mg
Folacin	0.1	mcg
Vit. B12	0.0	mcg

## Fats (without butter)

Foods and amounts used in composite (3 servings):

<i>Foods</i>	<i>Amount</i>	<i>Servings</i>
Margarine (with fatty-acid declaration)	10 mL	2
Canola oil	5 mL	$\frac{1}{3}$

Average nutrients provided by one serving of the composite:

Energy	36	kcal
	151	kJ
Protein	0.0	g
Fat	4.0	g
Carbohydrates	0.0	g
Cholesterol	0	mg
SFA	0.57	g
PUFA	1.56	g
MUFA	1.8	g
Dietary fibre	0	g
Calcium	0	mg
Phosphorus	0	mg
Iron	0	mg
Magnesium	0.0	mg
Zinc	0.0	mg
Sodium	34	mg
Potassium	1	mg
Vit. A	33	R.E.
Vit. C	0	mg
Thiamin	0.0	mg
Riboflavin	0.0	mg
Niacin	0.0	N.E.
Pyridoxine	0.0	mg
Folacin	0.0	mcg
Vit. B12	0.0	mcg

## Appendix IV

# Food Classification by Nutrients

### Fruits and Vegetables (in descending order of fibre)

- Message — eat 6 or more servings daily  
 — include at least 2 servings of vegetables

**Key nutrient criteria:** 12 mg or more of vitamin C  
 50 R.E. or more of vitamin A  
 11 mcg or more of folacin

### Nutrition-labelling criteria:

	Source	Good source	Excellent source
Vitamin C (mg)	4	12	20
Vitamin A (R.E.)	50	150	250
Folacin (mcg)	11	33	55

### A. Fruits

- Serving sizes** — 1 fruit  
 — 125 mL fruit (fresh, frozen or canned)  
 — 125 mL fruit juice (fresh, frozen or canned)

- a. Fruits that meet at least one of the key nutrient criteria and provide an *excellent source* of at least one key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Apricots, dried	125 mL	2	497*	7	6.6
Avocado, raw, pureed	125 mL	10	74	75*	3.0
Orange, raw	1 fruit	70*	27	40	2.4
Grapefruit, white, sections	125 mL	41*	1	12	2.2
Kiwifruit, raw	1 med.	57*	14	—	2.1
Strawberries, raw	125 mL	45*	2	14	1.7
Mango, raw, sliced	125 mL	24*	339*	—	1.7
Papaya, raw, cubed	125 mL	46*	149	—	1.3
Lemon, raw	1 fruit	31*	2	6	1.2
Strawberries, unsweetened	125 mL	32*	3	13	1.2
Tangerine, raw	1 fruit	26*	77	17	0.8
Cantaloupe, cubed	125 mL	36*	272*	14	0.7
Honeydew melon, cubed	125 mL	22*	4	27	0.7
Lemon juice, fresh	125 mL	59*	3	17	0.4

## Appendix IV

a. (continued)

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Orange juice, fresh	125 mL	65*	26	40	0.1
Orange juice, frozen	125 mL	51*	10	58	0.1
Grapefruit juice, frozen	125 mL	44*	1	5	0.1

\* excellent source

— data unknown

b. Fruits that meet at least one of the key nutrient criteria and provide a *good source* of at least one key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Prunes, dried, uncooked	125 mL	3	169*	3	6.0
Blackberries, raw	125 mL	16*	12	26	3.8
Raspberries, raw	125 mL	16*	8	17	3.2
Apricots, with skin, canned	125 mL	4	166*	2	1.7
Apricots, raw, halves	125 mL	8	214*	7	1.6
Limes, raw	1 fruit	19*	1	5	1.4

\* good source

c. Fruits that meet at least one of the key nutrient criteria and provide a *source* of at least one key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Dates, dry, chopped	125 mL	0	5	12*	8.0
Pears, raw with skin	1 fruit	7*	3	12*	5.2
Bananas, raw	1 fruit	10*	9	22*	2.0

\* source

d. Foods that *do not* meet the key nutrient criteria but provide a *source* of at least one key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Raisins, seeded	125 mL	4*	0	3	5.2
Nectarines, raw	1 fruit	7*	101	5	3.3
Apples, with skin, raw	1 fruit	8*	7	4	2.6
Rhubarb, frozen, cooked	125 mL	4*	9	7	2.5
Cranberries, raw	125 mL	7*	3	1	2.1
Blueberries, raw	125 mL	10*	8	5	1.9
Peaches, canned	125 mL	4*	68	4	1.3
Cherries, sweet, raw	125 mL	5*	16	3	1.2
Cherries, sour	125 mL	8*	105	6	1.0
Grapes, adherent skin	125 mL	9*	6	3	1.0
Peaches, raw	1 fruit	6*	47	3	1.0
Plums, raw	1 fruit	6*	21	1	1.0
Pineapple, canned tidbits	125 mL	10*	3	6	0.9
Watermelon, diced	125 mL	8*	31	2	0.3

\* source

e. Fruits that *do not* meet the key nutrient criteria and *do not* provide a source of any key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Figs, dried	125 mL	1	14	8	11.9
Raisins, golden seedless	125 mL	2	3	3	5.2
Prunes, dried, cooked	125 mL	3	35	tr	4.7
Pears, canned	125 mL	1	0	2	2.6

tr = trace

**B. Vegetables**

- Serving sizes** — 1 vegetable  
 — 125 mL vegetables (fresh, frozen and canned)  
 — 125 mL vegetable juice (fresh, frozen or canned)

- a. Vegetables that meet at least one of the key nutrient criteria and provide an *excellent source* of at least one key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Sweet potatoes, boiled	125 mL	30*	2950*	19	4.3
Snowpeas, boiled	125 mL	41*	11	25	4.2
Spinach, boiled	125 mL	9	779*	139*	3.5
Squash, winter, baked	125 mL	10	386*	30	3.1
Brussels sprouts, boiled	125 mL	51*	59	49	3.0
Rutabagas, boiled	125 mL	28*	0	20	2.7
Corn kernels, canned	125 mL	9	27	55*	2.3
Carrots, boiled, sliced	125 mL	2	2020*	11	2.3
Cabbage, red, boiled	125 mL	27*	2	10	2.2
Beet greens, boiled	125 mL	19	391*	11	2.2
Broccoli, boiled	125 mL	51*	115	56*	1.9
Swiss chard, boiled	125 mL	17	290*	8	1.9
Carrots, raw	1 carrot	7	2030*	10	1.8
Asparagus, boiled	125 mL	26*	79	93*	1.6
Spring onions	125 mL	24*	264	7	1.6
Cabbage, red, raw	125 mL	21*	1	8	1.3
Spinach, raw	125 mL	8	199	57*	1.2
Broccoli, raw	125 mL	43*	72	33	1.1
Cauliflower, boiled	125 mL	37*	1	34	1.1
Parsley, raw	125 mL	29*	165	58*	1.1
Green pepper, raw	125 mL	68*	28	9	1.0

\* excellent source

- b. Vegetables that meet at least one of the key nutrient criteria and provide a *good source* of at least one key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Green peas, boiled	125 mL	12*	51	53*	5.7
Potatoes, baked in skin	1 large	26*	0	22	4.2
Parsnips, boiled	125 mL	11	0	48*	3.3

b. (continued)

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Turnips, boiled	125 mL	14*	0	11	2.7
Beets, boiled	125 mL	5	1	48*	2.1
Tomato, raw	1 tomato	18*	139	12	1.5
Cabbage, boiled	125 mL	19*	7	16	1.4
Tomatoes, stewed	125 mL	18*	74	7	1.4
Radishes, raw	125 mL	14*	1	16	1.3
Tomato juice	125 mL	14*	72	26	0.9
Cabbage, raw	125 mL	17*	5	21	0.7
Lettuce, Cos or Romaine	125 mL	7	75	39*	0.4

\* good source

c. Vegetables that meet at least one of the key nutrient criteria and provide a *source* of at least one key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Lima beans, immature, boiled	125 mg	9*	33	24*	4.5
Potatoes, boiled without skin	1 medium	10*	0	12*	2.0
Onions, boiled	125 mL	6*	0	14*	1.9
Green beans, boiled	125 mL	6*	44	22*	1.6
Mushrooms, boiled	125 mL	3	0	15*	1.2
Lettuce, Boston	125 mL	2	28	21*	0.4
Lettuce, Looseleaf	125 mL	5*	55	15*	0.4
Lettuce, Iceberg	125 mL	1	10	16*	0.2

\* source

d. Vegetables that do not meet the key nutrient criteria and do not provide a source of any key nutrient

Food	Portion	Key nutrients			
		Vit. C (mg)	Vit. A (R.E.)	Folacin (mcg)	Fibre (g)
Eggplant, boiled	125 mL	1	3	7	1.3
Celery, raw	125 mL	4	8	6	0.9
Alfalfa sprouts	125 mL	1	3	6	0.5
Cucumber, raw	125 mL	3	3	8	0.3



**Breads and Cereals** (in descending order of fibre)

Message — eat 6 or more servings daily  
 — choose low-fat foods

**Key nutrient criteria:** 0.06 mg or more of thiamin  
 0.65 g or more of iron

**Nutrition-labelling criteria:**

	Source	Good source	Excellent source
Thiamin (mg)	0.06	0.18	0.30
Iron (mg)	0.65	1.95	3.25

**Serving sizes** — 1 slice bread  
 — 125 mL cooked cereal  
 — 30 g ready-to-eat cereal  
 — 125 mL cooked rice or pasta  
 — 1 roll or bagel  
 — 1/2 hamburger or hot dog bun

- a. Foods that meet at least one of the key nutrient criteria and provide an *excellent source* of at least one key nutrient

Food	Portion	Key nutrients		Other significant nutrients		
		Thiamin (mg)	Iron (mg)	Fat (g)	Chol.** (mg)	Fibre (g)
Cereal, All Bran	30 g	0.60*	3.99*	0.6	0	9.0
Cereal, 100% Bran	30 g	0.60*	3.99*	0.5	0	8.9
Cereal, Bran Buds	30 g	0.60*	3.99*	0.5	0	8.3
Cereal, Corn Bran	30 g	0.60*	3.99*	1.1	0	5.7
Cereal, Raisin Bran	30 g	0.60*	3.99*	0.4	0	4.7
Cereal, Bran Flakes	30 g	0.60*	3.99*	0.5	0	3.2
Cereal, Wheaties	30 g	0.60*	3.99*	0.6	0	2.7
Cereal, Cheerios	30 g	0.60*	3.99*	2.1	0	1.9
Cereal, Cream of Wheat, cooked	125 mL	—	7.98*	0.2	0	0.9
Cereal, Special K	30 g	0.60*	3.99*	0.1	0	0.3
Cereal, Rice Krispies	30 g	0.60*	3.99*	0.1	0	0.3
Cereal, Corn Flakes	30 g	0.60*	3.99*	0.1	0	0.3

\* excellent source

\*\* cholesterol

— data unknown

b. Foods that meet at least one of the key nutrient criteria and provide a *good source* of at least one key nutrient

Food	Portion	Key nutrients		Other significant nutrients		
		Thiamin (mg)	Iron (mg)	Fat (g)	Chol. (mg)	Fibre (g)
Cereal, granola, homemade	30 g	0.18*	1.19	8.2	0	1.8
Cookie, sandwich type with peanut butter	4	0.24*	0.89	6.7	39	0.1

\* good source

c. Foods that meet at least one of the key nutrient criteria and provide a *source* of at least one key nutrient

Food	Portion	Key nutrients		Other significant nutrients		
		Thiamin (mg)	Iron (mg)	Fat (g)	Chol. (mg)	Fibre (g)
Muffins, bran	40 g	0.05	1.38	3.9	41	3.7
Cereal, Shredded Wheat	30 g	0.08*	0.94*	0.4	0	3.0
Cereal, oatmeal, cooked	125 mL	0.14*	0.84*	1.2	0	2.7
Muffins, English, whole-wheat	1/2 muffin	0.12*	0.93*	0.8	0	2.4
Buns, whole-wheat	1 bun	0.12*	0.84*	1.0	0	2.0
Bread, pumpernickel	1 slice	0.07*	0.82*	0.4	0	1.7
Bread, whole-wheat	1 slice	0.08*	0.84*	0.7	0	1.6
Cookies, fig bars	4 cookies	0.07*	1.09*	3.1	22	1.3
Cookies, oatmeal with raisins	4 cookies	0.11*	1.47*	8.0	20	1.3
Buns, raisin	1/2 bun	0.08*	0.69*	1.6	1	1.1
Doughnuts, cake type	1	0.09*	1.03*	10.8	35	1.0
Rice, brown	125 mL	0.08*	0.45*	0.5	0	1.0
Bread, cracked wheat	1 slice	0.06*	0.62	0.5	0	1.0
Bread, raisin	1 slice	0.07*	0.64	0.7	1	0.9
Cookies, chocolate chip commercial	4 cookies	0.05	1.04*	8.8	16	0.8
Cookies, chocolate chip homemade	4 cookies	0.04	0.85*	12.0	20	0.8
Pasta, enriched (macaroni, spaghetti, lasagna, etc.)	125 mL	0.10*	0.42	0.3	0	0.7

## Appendix IV

c. (continued)

Food	Portion	Key nutrients		Other significant nutrients		
		Thiamin (mg)	Iron (mg)	Fat (g)	Chol. (mg)	Fibre (g)
Crackers, whole wheat	5 crackers	0.11*	0.73*	3.0	—	0.7
Buns, homemade	1 bun	0.09*	0.93*	3.1	12	0.7
Rolls, Danish	1 piece	0.07*	0.59	8.2	22	0.7
Egg noodles, enriched	125 mL	0.10*	0.52	1.3	26	0.6
Muffins, English	1/2 muffin	0.10*	0.88*	0.6	0	0.6
Bagel, medium size	1/2 bagel	0.11*	1.00*	0.4	0	0.6
Crackers, graham	4 crackers	0.03	0.88*	2.7	0	0.5
Crackers, graham, chocolate coated	2 crackers	0.02	0.87*	6.1	0	0.5
Crackers, graham, honey-coated	4 crackers	0.02	0.83*	3.2	0	0.5
Bagel, small size	1 bagel	0.11*	0.94*	0.4	0	0.5
Bread, Italian	1 slice	0.09*	0.75*	0.2	0	0.5
Bread, white	1 slice	0.08*	0.69*	0.9	10	0.5
Rolls, hard, commercial	1 roll	0.07*	0.62	0.8	0	0.5
Rolls, plain, commercial (hamburger, hot dog)	1/2 roll	0.08*	0.69*	1.6	0	0.5
Croissant, commercial	1 frozen	0.11*	1.01*	8.1	29	0.5
Rolls, sweet	1/2 roll	0.08*	0.71*	2.5	5	0.5
Bread, French or Vienna	1 slice	0.07*	0.62	0.7	0	0.4
Biscuits, baking powder	1	0.06*	0.60	4.8	tr	0.4
Cookies, sandwich type	4	0.07*	0.71*	9.0	16	0.4
Doughnuts, yeast type	1	0.07*	0.78*	11.2	11	0.4
Crackers, butter	5	0.06*	0.64	3.4	9	0.3
Cookies, gingersnaps	4	0.06*	0.79*	2.5	11	0.2
Cookies, shortbread	4	0.10	0.80*	6.9	12	0.2
Cookies, assorted	4	0.06*	0.71*	7.0	13	0.1

\* source

— data unknown

tr = trace

d. Foods that *do not* meet the key nutrient criteria and *do not* provide a source of any key nutrient

Food	Portion	Key nutrients		Other significant nutrients		
		Thiamin (mg)	Iron (mg)	Fat (g)	Chol. (mg)	Fibre (g)
Tortillas	1	0.01	0.37	1.0	0	0.9
Bread, light rye	1 slice	0.05	0.58	3.7	tr	0.7
Cakes, chocolate brownies	1	0.03	0.55	6.3	17	0.7
Pasta, unenriched	125 mL	0.01	0.34	0.3	0	0.6
Egg noodles, unenriched	125 mL	0.02	0.51	1.3	26	0.6
Cake, chocolate	30 g	0.03	0.43	3.9	17	0.6
Cake, chocolate cheesecake	30 g	0.03	0.51	7.5	32	0.5
Rice, white, unenriched	125 mL	0.012	0.18	0.1	0	0.4
Cake, carrot, no icing	30 g	0.04	0.46	7.6	25	0.4
Muffin, oatmeal	1/2	0.06	0.47	1.6	11	0.3
Crackers, saltines	5	0.05	0.60	1.7	0	0.3
Crackers, soda	5	0.05	0.52	1.9	0	0.3
Pancakes, homemade	1	0.05	0.45	1.9	14	0.3
Cake, yellow, no icing, homemade	30 g	0.04	0.43	3.8	16	0.2

tr = trace

#### Meat, Fish, Poultry and Alternates (in ascending order of fat)

- Message — eat 3 servings daily  
— choose low-fat foods

**Key nutrient criterion:** 12 g or more of protein per serving

- Serving sizes** — 60 g cooked, lean meat, fish, poultry or liver  
— 50 mL peanut butter (reduced portion)  
— 250 mL cooked, dried peas, beans or lentils  
— 125 mL nuts or seeds  
— 60 g cheese  
— 125 mL cottage cheese  
— 100 g egg = 2 large eggs

## Appendix IV

### a. Foods that meet the key nutrient criterion

Food	Key nutrient	Other significant nutrients				
	Protein (g)	Fat (g)	Chol.* (mg)	Sodium (mg)	Iron (mg)	Fibre (g)
Cottage cheese, dry curd	13.2	0.4	6	10	0.18	0
Haddock, baked or broiled	14.6	0.6	44	52	0.82	0
Atlantic Cod, baked or broiled	13.8	0.6	34	32	0.30	0
Perch, baked or broiled	15.0	0.6	70	48	0.70	0
Northern pike, baked or broiled	14.8	0.6	100	30	0.42	0
Lentils, boiled	18.8	0.8	0	4	7.00	8
Lima beans, dry, boiled	15.4	0.8	0	4	4.70	6
Kidney beans, boiled	16.2	1.0	0	4	5.50	6
Whiting, baked or broiled	14.0	1.0	50	80	0.26	0
White beans, boiled	17.0	1.2	0	12	7.00	12
Cottage cheese (1% BF)	15.2	1.2	6	500	0.18	0
Tuna, white, canned in water	16.0	1.4	26	236	0.36	0
Halibut, baked or broiled	16.0	1.8	24	42	0.64	0
Rainbow smelt, baked or broiled	13.6	1.8	54	46	0.70	0
Beef, kidney, simmered	15.2	2.0	232	80	4.38	0
Veal, leg, lean, roasted	16.8	2.0	62	41	0.54	0
Cottage cheese (2% BF)	16.4	2.2	0	484	0.18	0
Beef, top round steak, lean, broiled	18.0	2.4	38	30	1.68	0
Rainbow trout, baked or broiled	15.8	2.6	44	20	1.46	0
Lamb, leg, lean, roasted	12.3	2.7	38	37	1.09	0
Pork, fresh, tenderloin, lean, roasted	17.2	2.8	42	40	0.92	0
Veal, leg, lean and fat, roasted	16.6	2.8	62	41	0.55	0
Beef, liver, braised	14.6	3.0	234	42	4.06	0
Bluefish, baked	15.8	3.2	42	62	0.42	0
Beef, top round steak, lean and fat, broiled	17.8	3.2	38	30	1.62	0
Chicken, liver, simmered	14.6	3.2	378	30	5.08	0
Pork, cured, ham, lean	15.0	3.4	34	796	0.56	0
Beef, heart, simmered	17.2	3.4	116	38	4.50	0
Mackerel, canned, drained	14.0	3.8	48	228	1.22	0
Tuna, fresh, dry heat	18.0	3.8	30	30	0.78	0
Beef, sirloin steak, lean, broiled	17.6	4.0	44	34	1.86	0

a. (continued)

Food	Key nutrient	Other significant nutrients				
	Protein (g)	Fat (g)	Chol.* (mg)	Sodium (mg)	Iron (mg)	Fibre (g)
Chickpeas (Garbanzo beans), boiled	15.4	4.4	0	12	5.00	6
Salmon, Sockeye, canned	12.2	4.4	26	322	0.64	0
Pork, fresh, leg butt, lean, roasted	18.8	4.6	44	48	0.74	0
Salmon, Coho, fresh moist heat	16.4	4.6	30	36	0.54	0
Beef, rump, lean, roasted	18.0	4.6	44	40	1.44	0
Tuna, white, canned in oil, drained	15.8	4.8	18	238	0.38	0
Pork, cured, back bacon, grilled	14.6	5.0	34	928	0.50	0
Cottage cheese, creamed	14.4	5.2	18	466	0.16	0
Pork, fresh, centre cut, chop, lean, broiled	19.0	5.6	40	46	0.42	0
Beef, sirloin steak, lean and fat, broiled	16.4	6.4	44	30	1.68	0
Beef, rib roast, lean, roasted	17.2	6.4	40	42	1.38	0
Sardines, Atlantic, canned in oil, drained	14.8	6.8	86	302	1.76	0
Pork, fresh, shoulder, lean, roasted	17.6	7.0	50	50	0.82	0
Herring, Atlantic, dry heat	13.8	7.0	46	70	0.84	0
Beef, rump, lean and fat, roasted	17.6	7.0	44	38	1.38	0
Beef, blade roast, lean, pot-roasted	19.4	7.2	52	34	2.10	0
Herring, Atlantic, kippered	14.8	7.4	50	550	0.90	0
Beef, ground, lean, broiled	15.2	8.6	42	42	1.42	0
Beef, corned, canned	16.2	9.0	52	604	1.74	0
Pork, fresh, leg butt, lean and fat, roasted	17.0	9.6	44	36	0.62	0
Lamb, leg, lean and fat, roasted	15.3	9.9	56	40	1.19	0
Cheese, Mozzarella partly skimmed	15.1	9.9	36	289	0.14	0
Pork, cured, ham, lean and fat, roasted	13.0	10.0	38	712	0.52	0



## Appendix IV

a. (continued)

Food	Key nutrient	Other significant nutrients				
	Protein (g)	Fat (g)	Chol.* (mg)	Sodium (mg)	Iron (mg)	Fibre (g)
Beef, blade roast, lean and fat, pot-roasted	17.2	10.6	52	30	1.74	0
Mackerel, Atlantic, dry heat	14.2	10.6	46	52	0.94	0
Beef, ground, medium, broiled	14.2	11.0	42	46	1.26	0
Egg, chicken, boiled	12.2	11.2	548	138	2.10	0
Beef, rib roast, lean and fat, roasted	15.0	12.0	42	34	1.14	0
Pork, fresh, centre cut, chop, lean and fat, broiled	16.6	12.2	40	42	0.48	0
Beef, tongue, simmered	13.2	12.4	64	36	2.04	0
Beef, ground, regular, broiled	14.4	12.4	44	50	1.46	0
Pork, fresh, shoulder, lean and fat, roasted	15.6	12.6	44	40	0.78	0
Pork, fresh, spareribs, braised	15.2	15.2	48	56	1.10	0
Soybeans, boiled	30.2	16.2	0	2	9.34	8
Cheese, processed, cheddar	13.3	18.8	57	858	0.2	0
Cheese, cheddar	15.0	19.8	62	372	0.40	0
Salami, dry or hard	13.6	20.2	481	356	0.78	0
Peanut butter, sugar, salt fat, smooth style	13.4	27.3	0	261	0.91	3
Peanut butter, no added sugar, salt, fat	15.5	27.9	0	9	0.99	4
Pork, cured, side bacon	18.2	29.6	50	958	0.96	0
Sesame seeds, whole, dried	13.5	37.8	0	8	1.06	8
Sunflower seeds, dried	17.4	37.8	0	2	5.16	10
Peanuts, dry-roasted	18.2	38.4	0	5	1.74	6
Almonds, dried, unblanched	15.0	39.2	0	8	2.74	5

\* cholesterol

b. Foods that *do not* meet key nutrient criterion

Food	Key nutrient	Other significant nutrients				
	Protein (g)	Fat (g)	Chol. (mg)	Sodium (mg)	Iron (mg)	Fibre (g)
Surimi	9.0	0.6	18	86	0.16	0
Sole, dry heat	11.2	0.8	40	62	0.22	0
Salmon, Chinook, smoked	11.0	2.6	14	1,200	0.50	0
Cottage cheese, creamed, with fruit	11.8	4.0	14	484	0.14	—
Pork, cured, ham, luncheon meat, regular sliced	10.6	6.4	34	790	0.60	0
Scallops, breaded, fried	10.8	6.6	36	278	0.50	—
Sardines, Pacific, canned in tomato sauce, drained	9.8	7.2	36	248	1.38	0
Fish sticks, frozen, reheated	9.4	7.4	68	350	0.44	—
Salami, turkey	9.8	8.2	50	602	0.96	0
Bologna, turkey	8.2	9.2	60	526	0.92	0
Wieners, turkey	8.6	10.6	64	856	1.10	0
Salami, beef/pork, cooked	8.4	12.0	38	640	1.60	0
Bologna, beef/pork	7.0	17.0	32	612	0.90	0
Liverwurst	8.4	17.2	94	516	3.84	0
Wieners, beef/pork	6.8	17.4	30	672	0.70	0
Sausages, fresh, pork	11.8	18.6	50	776	0.74	0
Braunschweiger	8.2	19.2	94	686	5.62	0
Cheese, cream	14.5	20.9	66	177	0.7	0
Sausages, fresh, beef/pork	8.2	21.8	42	484	0.68	0
Walnuts	7.6	32.6	0	6	1.30	0
Sesame butter (Tahini)	11.8	33.0	0	8	12.46	2

— data unknown

**Milk and Milk Products** (in ascending order of fat)

Message — eat 2 or more servings daily  
 — choose low-fat foods

**Key nutrient criterion:** 300 mg or more of calcium per serving

**Nutrition-labelling criteria:**

	Source 55	Good source 165	Excellent source 275
Calcium (mg)			

**Serving sizes** — 250 mL milk  
 — 175 mL yogurt  
 — 45 g cheese<sup>+</sup>

**a. Foods that meet the key nutrient criterion**

Food	Portion	Key nutrient	Other significant nutrients		
		Calcium (mg)	Fat (g)	Chol* (mg)	Sodium (mg)
Yogurt, plain (0.18% BF)	175 mL	361	0.3	3	139
Milk, skim	250 mL	319	0.5	5	133
Milk, evaporated, skim (undiluted)	250 mL	783	0.5	10	311
Yogurt, coffee/vanilla (1.25% BF)	175 mL	310	2.3	9	119
Buttermilk	250 mL	301	2.3	9	272
Yogurt, fruit varieties (1.41% BF)	175 mL	306	2.6	10	118
Yogurt, plain (1.55% BF)	175 mL	331	2.8	11	127
Milk, 2% BF	250 mL	314	4.9	19	129
Milk, chocolate (2% BF)	250 mL	300	5.3	18	159
Milk, evaporated (2% BF, undiluted)	250 mL	739	5.4	21	297
Milk pudding, instant (whole milk)	250 mL	396	6.7	30	341
Milk shake, vanilla, thick	250 mL	303	6.3	24	198
Cheese, Mozzarella, partly skimmed (16.5% BF)	45 g	305	7.4	27	217
Cheese, Mozzarella, partly skimmed (17% BF)	45 g	329	7.7	24	237
Milk, whole	250 mL	308	8.6	35	126
Coffee substitute, "Postum" (whole milk)	250 mL	310	8.6	34	128

a. (continued)

Food	Portion	Key nutrient	Other significant nutrients		
		Calcium (mg)	Fat (g)	Chol* (mg)	Sodium (mg)
Chocolate syrup (whole milk)	250 mL	310	8.9	35	162
Flavoured powder mixes (whole milk)	250 mL	322	9.2	35	172
Malted milk, chocolate flavour (whole milk)	250 mL	321	9.6	36	178
Milk, hot cocoa, homemade (whole milk)	250 mL	315	9.6	35	130
Milk, malted, natural flavour (whole milk)	250 mL	367	10.5	39	228
Milk, goat	250 mL	344	10.7	29	128
Cheese, processed food, Swiss	45 g	326	10.9	37	698
Cheese, processed, Swiss	45 g	347	11.3	38	61
Cheese, Parmesan, hard	45 g	533	11.6	31	721
Cheese, Tilsit (whole milk)	45 g	315	11.7	46	339
Cheese, Provolone	45 g	340	12.0	31	394
Cheese, Romano	45 g	479	12.1	47	540
Cheese, Parmesan, shredded	45 g	564	12.3	32	763
Cheese, Swiss (Emmentaler)	45 g	432	12.4	41	117
Cheese, Edam	45 g	329	12.5	40	434
Cheese, Gouda	45 g	321	12.6	52	376
Cheese, Caraway	45 g	303	13.1	42	311
Cheese, Brick	45 g	303	13.4	43	252
Cheese, Parmesan, grated	45 g	619	13.5	35	838
Cheese, Muenster	45 g	323	13.5	43	282
Cheese, Monterey	45 g	336	13.6	40	241
Cheese, Colby	45 g	308	14.4	43	272
Cheese, Gruyère	45 g	455	14.6	49	151
Cheese, Cheddar	45 g	325	14.9	47	279
Eggnog, commercial (7% BF)	250 mL	349	20.1	158	146
Milk, evaporated, whole (undiluted)	250 mL	694	20.8	78	282
Milk, sweetened condensed	250 mL	917	28.1	110	411
Milk, reindeer	250 mL	666	51.4	37	411

\* cholesterol

\* All cheeses, including cottage, Ricotta and processed cheeses, were calculated at 45 g servings for comparative purposes.

b. Foods that do not meet the key nutrient criterion but provide an *excellent source* of the key nutrient

Food	Portion	Key nutrient	Other significant nutrients			
		Calcium (mg)	Fat (g)	Chol (mg)	Sodium (mg)	
Yogurt, fruit varieties (1.08% BF)	175 mL	275	2.0	8	106	
Milk shake, chocolate, thick	250 mL	279	5.7	22	235	
Milk shake, fast-food	250 mL	277	7.6	28	209	
Milk pudding from mix, cooked	250 mL	280	8.2	33	354	
Milk, chocolate (whole milk)	250 mL	296	9.0	32	157	
Cheese, Port du Salut	45 g	292	12.7	55	240	
Cheese, Roquefort	45 g	298	13.8	41	814	
Cheese, Cheshire	45 g	289	13.8	46	315	
Cheese, processed, pimento	45 g	276	14.0	42	642	
Cheese, processed, Cheddar	45 g	277	14.1	43	644	

c. Foods that do not meet the key nutrient criterion but provide a *good source* of the key nutrient

Food	Portion	Key nutrient	Other significant nutrients			
		Calcium (mg)	Fat (g)	Chol (mg)	Sodium (mg)	
Yogurt, fruit varieties (1.15% BF)	175 mL	251	2.0	8	96	
Cheese, processed, Cheddar, (skim milk)	45 g	253	2.8	—	693	
Yogurt, plain (3.25% BF)	175 mL	219	5.9	23	84	
Yogurt, fruit-bottom (3.63% BF)	175 mL	222	6.9	—	96	
Ice milk	250 mL	217	6.9	23	129	
Cheese, processed spread, Cheddar	45 g	253	9.5	25	731	
Cheese, Feta	45 g	229	9.9	41	519	
Cheese, Mozzarella (22.5% BF)	45 g	242	10.1	37	175	
Cheese, Camembert	45 g	174	10.9	32	379	
Cheese, processed food (cold pack) Cheddar	45 g	224	11.0	29	435	
Cheese, processed food, Cheddar	45 g	258	11.1	29	718	
Cheese, Mozzarella (25% BF)	45 g	259	11.1	40	187	
Cheese, Limburger	45 g	224	12.3	41	360	
Cheese, Blue	45 g	237	12.9	34	628	
Cheese, Gjetost (goat)	45 g	180	13.3	42	270	
Cheese, Fontina	45 g	248	14.0	52	360	

## c. (continued)

Food	Portion	Key nutrient	Other significant nutrients			
		Calcium (mg)	Fat (g)	Chol (mg)	Sodium (mg)	
Ice cream, regular	250 mL	186	15.1	63	123	
Cream (10% BF)	250 mL	273	25.6	80	105	
Cream, sour, cultured (14% BF)	250 mL	279	36.6	103	112	
Cream, whipping (32% BF)	250 mL	172	80.8	292	91	

— data unknown

d. Foods that do not meet the key nutrient criterion but provide a *source* of the key nutrient

Food	Portion	Key nutrient	Other significant nutrients			
		Calcium (mg)	Fat (g)	Chol (mg)	Sodium (mg)	
Cheese, Ricotta (2% milk)	45 g	122	3.6	14	56	
Cheese, Ricotta (made with whole milk)	45 g	93	5.8	23	38	
Milk, human	250 mL	84	11.4	36	44	
Cheese, Brie	45 g	83	12.5	45	283	
Ice cream, rich (16% BF)	250 mL	160	25.0	93	114	

e. Foods that *do not* meet the key nutrient criterion and *do not* provide a source of the key nutrient

Food	Portion	Key nutrient	Other significant nutrients			
		Calcium (mg)	Fat (g)	Chol (mg)	Sodium (mg)	
Cheese, cottage, dry curd (0.4% BF)	45 g	14	0.2	3	6	
Cheese, cottage (1.0% BF)	45 g	28	0.5	2	188	
Cheese, cottage (2.0% BF)	45 g	31	0.9	4	183	
Cheese, cottage, creamed, with fruit	45 g	21	1.5	5	182	
Cheese, cottage, creamed (4.5% BF)	45 g	27	2.0	7	182	
Milk, soy, fluid	250 mL	10	4.8	0	30	



e. (continued)

Food	Portion	Key nutrient	Other significant nutrients		
		Calcium (mg)	Fat (g)	Chol (mg)	Sodium (mg)
Cheese, Neufchatel	45 g	34	10.5	34	180
Cheese, cream	45 g	36	15.7	49	133
Milk, coconut	250 mL	41	60.5	0	38

*Report of the Task  
Group on Food  
Consumption to the  
Communications/  
Implementation  
Committee*



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**T**he Task Group on Food Consumption expresses appreciation to all those who contributed data to this report.





# 1.

## Executive Summary

The Task Group on Food Consumption was established to provide information on food consumption patterns and the distribution of nutrients in the Canadian food supply, to relate this information to the updated Nutrition Recommendations provided by the Scientific Review Committee (SRC), and to predict the impact of revised nutrition recommendations on the food supply and the development of new products.

Energy and ten nutrients were identified as being of public health significance, and six major databases were accessed in addressing the issues identified.

Food and nutrient consumption trends from 1972 to 1986 were itemized. These changes were attributed to shifts in demographics, variations in relative prices of foods, changes in disposable income, shifts in tastes and preferences and changing health concerns.

Any changes in the Nutrition Recommendations for Canadians proposed by the SRC will have a profound and varied impact on how Canadians deal with food. Because of this, a multisectoral approach will be required to facilitate compliance. Revised recommendations may dictate drastic changes in food choices by consumers, breeding practices and/or choice of species, cultivar, etc. by producers and the development of new specialized products and/or improved preservation techniques by the food industry. This was illustrated by using as an example the combination of a recommendation to decrease the percentage of energy derived from fat and a recommendation to increase the consumption of complex carbohydrates.

The need for a national nutrition monitoring and surveillance system was identified, as was the need for greater emphasis on nutrition education programs for Canadians.



## 2. Introduction

In 1987, the Minister of National Health and Welfare in Canada established two committees to review and revise nutrition recommendations for healthy Canadians, establishing new guidelines which would promote and maintain health while reducing the risk of nutrition-related diseases. The Scientific Review Committee (SRC) was charged with reviewing the scientific evidence on which to base nutrition recommendations; the Communications/Implementation Committee (CIC) was responsible for translating the scientific statements generated by the SRC into dietary advice for the public and recommending appropriate implementation strategies.

### **Purpose of the Task Group on Food Consumption**

A link between nutrients required for health promotion and maintenance and food consumption is essential in developing appropriate dietary advice for the public. In support of the work of the CIC, the Task Group on Food Consumption was established to provide information on food consumption patterns and the distribution of nutrients in the Canadian food supply, to relate this information to the updated Nutrition Recommendations provided by the SRC and to predict the impact of revised nutrition recommendations on the food supply and the development of new products.

The Task Group was comprised of representatives from government, the food industry and the research community who had expertise in food consumption data collection and analysis. The terms of reference and membership of the Task Group are found in Appendix I.



## 3. Methodology

The Task Group on Food Consumption met formally on three different occasions in the course of fulfilling its mandate. Issues were identified, databases accessed and reports with recommendations for the CIC prepared.

### Issue Identification

The Task Group initially identified a number of issues of public health significance in the context of food consumption and buying practices. The scientific statements of the SRC and consultations with the CIC provided direction, as did the expertise of task group members.

The Task Group identified energy and the following nutrients to be of public health significance: total fat, monounsaturated fatty acids, saturated fatty acids, polyunsaturated fatty acids, cholesterol, calcium, iron, sodium, carbohydrate and dietary fibre. Caffeine, alcohol and complex carbohydrates were not identified by the CIC as issues to be addressed by the Task Group when it was formed. Therefore, these were not examined in detail. Related issues to be examined were food costs, consumption trends in terms of availability of foods, and food purchase and product development as they relate to food consumption.

### Databases

A number of databases were accessed in addressing the identified issues.

- *Canadian Nutrient File*: The Canadian Nutrient File (CNF) is a computerized database of the nutrient contents of 3500 foods, based on USDA Handbook No. 8 and Canadian data where available.<sup>1</sup> The CNF is used for analytical purposes and provides data on seven to 76 nutrients per food. The Task Group used the CNF to identify nutrient sources in the Canadian food supply.
- *Agriculture Canada Nutrient Assessment Program*: The Agriculture Canada Nutrient Assessment Program (AGNAP) is a software program which links the nutrient data in the CNF with food disappearance and expenditure data to provide an assessment of nutrient availability and consumption for 21 major nutrients.<sup>2</sup>
- *Nutrition Canada Food Intake Data*: Food intake data collected during the national Nutrition Canada Survey are considered to be the most complete set of data available.<sup>3</sup> Due to their date of collection (1971-72), these data were used by the Task Group for historical

1 Health and Welfare Canada, *Canadian Nutrient File* (Ottawa, 1988).

2 Agriculture Canada, Food Markets Analysis Division (Ottawa, 1989).

3 Health and Welfare Canada, *Nutrition Canada National Survey* (Ottawa, 1973).



comparison. Food and nutrient sources and average portion sizes were calculated from these data.

- *Apparent Per Capita Food Consumption Data:* Apparent Per Capita Food Consumption Data are calculated annually by Statistics Canada from supply and disposition balance sheets.<sup>4</sup> Data on exports, ending stocks, non-food use and manufacturing (disposition) are subtracted from data on production, imports and beginning stocks (supply) to provide an indication of the amounts of basic foods available to Canadians in a given year and of the changes in these amounts over time. As losses of food during processing, marketing and home preparation are not accounted for and processed foods are not identified (for example, bread data are reported on an individual ingredient basis), the data tend to overestimate actual food consumption. Data are expressed according to food groups. The item classification for each food group is provided in Appendix VI, Table 1.

By applying AGNAP to these data, an assessment of gross trends, that is, changes in availability levels of nutrients and their dietary sources, can be determined. Because of the limitations of the database, absolute levels of nutrients available for consumption cannot be determined. The Task Group accessed disappearance data from 1972 (completion of Nutrition Canada Survey) to 1986 (most recent set of data).

- *Family Food Expenditure Survey Data:* Quantities of food purchased at the retail level for home consumption and information on meals eaten away from home are determined for the Canadian population and for specific groups, such as the elderly, through the Family Food Expenditure Survey, which is conducted every two to four years by Statistics Canada.<sup>5</sup> These data, collected by means of weekly diaries, are considered to reflect actual food intake more closely than do Apparent Per Capita Food Consumption data, since foods are reported in purchased form and only food losses in the home are not accounted for. A limitation of these data is their reporting base, which is by family rather than on an individual basis. To estimate daily per capita food consumption by individual family members, data are divided by family size and then by seven. Data are expressed according to food groups. The item classification for each food group is provided in Appendix VI, Table 2.

Application of AGNAP to Family Food Expenditure Survey data provides close estimates of the nutritional quality of the Canadian diet in recent years and highlights the importance of specific foods and food groups in the diet.

- *Small Populations Survey Data:* Attempts were made to obtain information from small population studies. However, because the results of the majority of these studies remain unpublished and the findings generally were

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4 Statistics Canada, *Apparent Per Capita Food Consumption in Canada*, Catalogue Nos. 32-229/230 (Ottawa, Minister of Supply and Services Canada, annual).

5 Statistics Canada, *Family Food Expenditures in Canada, 1982, 1986* (Ottawa: Minister of Supply and Services Canada, 1985, 1989).

similar to the "macro" studies, small populations survey data have not been included in this report.

- *Agriculture Canada Nutritious Food Basket:*<sup>6</sup> The Nutritious Food Basket is a determined set of food items in fixed proportions. Foods are selected and proportions are established according to three criteria.

First, it is based on spending patterns of average families, provided by Statistics Canada Family Food Expenditures Survey data. Because of significant differences in the purchasing patterns of families across the country, Agriculture Canada has developed a separate Nutritious Food Basket for 18 cities.

Second, the food items selected and the proportions established are altered to allow different age and sex groups to meet their nutritional needs based on the Recommended Nutrient Intakes and current nutritional thought.

Third, foods are selected among those priced by Statistics Canada for the Consumer Price Index.<sup>7</sup> Thus, data collected for the calculation of the CPI can be used to estimate the average weekly cost of a Nutritious Food Basket.

In summary, the Basket acts as a benchmark for determining the weekly dollars-and-cents cost, for average-income families, of a nutritious diet for various age and sex groups. It also helps monitor changes in this cost over time in 18 major Canadian cities.

- *Market Research and Food Service Data:* Data from market research and food service sources were accessed to provide information on food

practices, primarily on the types of foods consumed away from home. These sources are described in more detail in Appendix V.

## Reports

Following the identification of issues to be addressed and the procurement of databases, each member of the Task Group was responsible for reporting on a specific topic relating to food consumption: nutrient content of foods in Canada, nutrient sources in the Canadian diet, food and nutrient consumption based on food disappearance and purchase patterns, nutrient consumption based on small population surveys, food consumption away from home and the cost of a nutritious food basket. Reports on these topics are provided in Appendices II to V. Some overlap is found among the reports, since the topics were not mutually exclusive.

## Analyses and Recommendations

The reports in Appendices II to V were analyzed in the context of the terms of reference of the Task Group. The analysis provides the basis for this task group's report and recommendations to the CIC. The Task Group acknowledges that the databases for actual food and nutrient consumption by Canadians are inadequate. However, they represent the best sources of national data at the present time.

- 6 Agriculture Canada, Food Markets Analysis Division (Ottawa, 1989); L.G. Robbins and L. Robichon-Hunt, "The Agriculture Canada Nutritious Food Basket and the Thrifty Nutritious Food Basket, 1989", *Food Market Commentary* 11 (April 1989): 31-42.
- 7 S. Hewston, "Updating of the Consumer Price Index", *Food Market Commentary* 11 (April 1989): 25-30.



## 4. Discussion

### Consumption Trends

Food and nutrient consumption trends from 1972 to 1986 were examined on the basis of Apparent Per Capita Food Consumption (Appendix II, Table 1) and Family Food Expenditure Survey data (Appendix II, Table 2). These data were selected because no other comprehensive sets of data on actual food intake and subsequent nutrient status of Canadians have been available since the Nutrition Canada Survey of 1970-72 (Appendix II, Table 3). Thus, consumption is extrapolated from the availability of foods and foods purchased by households. Similar trends are observed in these two databases, although the extent of the trend is different from one source to the other.

#### Food

Since 1972, significant changes have occurred in the food items available for consumption by Canadians. These changes can be attributed to shifts in demographics, variations in relative prices of foods, changes in disposable income, shifts in tastes and preferences and changing health concerns.

- *Meat, fish and poultry:* Between 1972 and 1986, the apparent consumption of red meats decreased, while that of poultry and fish increased. The quantity of processed meats consumed also increased. These changes may have been due to a shift in demographics of the Canadian population; unemployment; reduction in available income spent on food; price; concern over fat intake; and increased consumption of fast foods (where chicken is a predominant food choice). Canadians also demanded more fresh and frozen, but less processed, fish than they did in 1972. Discretionary use of eggs decreased, although the use of eggs in processed and prepared

foods increased. The apparent consumption of pulses and nuts increased, including peanuts used in manufacturing peanut butter.

- *Dairy products:* Total fluid milk consumption remained relatively stable, although a shift to partly skimmed and skim milk, reflecting a desire to reduce dietary fat intake, was noted. Availability of yogurt for consumption increased dramatically with the introduction of fruit yogurts. Availability of cheese, particularly variety types, rose similarly due to increased use of cheese as a snack food, greater use in manufactured and fast food products (such as pizza) and increased preference for specialty and imported cheeses. The removal of the government subsidy on skim milk powder led to a substantial drop in demand for this product. The consumption of ice cream remained relatively steady.
- *Fats and oils:* Consumers shifted from animal fats (butter and lard) to vegetable fats (margarine, shortening and oils). However, the total amount consumed stabilized. Much of this shift was related to a desire by Canadians to reduce the amount of saturated fat in their diets; lower prices of some vegetable fats; the use of vegetable fats in deep-fat frying (especially in fast-food establishments); and increased convenience of "soft" margarines.
- *Bakery and cereal products:* Cereal product availability increased, with much of the growth attributed to a two-fold increase in rice consumption and increased use of pasta. The quantity of bakery products consumed decreased.
- *Fruits and vegetables:* The availability of fruits and vegetables, especially that of fresh products and fruit juices (particularly orange juice), increased. More exotic fruits were being imported to supplement traditional fruits in the diets of Canadians. Demand for fresh

vegetables can be attributed to the consumer's perception of the increased health benefit of these foods, a perception that is also evident in the large number of retail outlets specializing in fresh produce and salad bars.

- *Sugars and syrups:* Apparent consumption of sugar decreased slightly, reflecting consumer demand for "lite" and artificially sweetened foods and greater use of high-fructose corn syrups by the food-processing industry.
- *Beverages:* Apparent consumption of coffee remained stable while that of soft drinks grew substantially. Consumption of beer and spirits decreased marginally in contrast to significant increases in wine consumption.
- *Foods consumed away from home:* Trends in foods consumed away from home depend on a number of factors, including consumer demand for convenience, price of ingredients, availability and nutrition concerns. Market research (Appendix V) reveals that food service sales represent 37% of consumers' total food expenditures, with the average Canadian eating away from home nearly three times weekly. Between 1985 and 1988, increased consumption of soups, sandwiches and salads and decreased consumption of hamburgers and chicken were noted. Lunch was the meal most frequently consumed away from home, followed by dinner and then breakfast. A wide variety of foods, ranging from hamburgers, pizza and quiche to ethnic cuisine, is available, especially in urban centres. However, the choice of foods varies by region, with Western Canada showing a preference for hamburgers and more eastern regions favouring pizza and chicken (Appendix V).

#### Energy and Nutrients

Trends in nutrient consumption were derived from Apparent Per Capita Food Consumption and Family Food Expenditure Survey data, which assess apparent consumption only.

*Apparent Per Capita Food Consumption and Family Food Expenditure Survey:* Energy intakes appeared to decrease slightly, by 6.5%, between 1972 and 1986 (Appendix II, Table 4). At the same time, a

shift in nutrients contributing to energy occurred. The slight increase in the consumption of cereals (particularly rice), soft drinks and alcoholic beverages was accompanied by a decrease in the consumption of red meats, butter, whole milk and eggs. Dietary fibre intake showed little change.

Apparent consumption of protein increased marginally, perhaps due to the higher consumption of dairy products and poultry. The percentage of energy from fat in the diet of Canadians decreased to approximately 38% of energy in 1986 (Appendix II, Table 6), possibly due in part to a shift in food sources; that is, trends towards leaner meats, lower-fat milks and more poultry and fish. There was a shift in the fatty-acid composition of the diet: available saturated fatty acids decreased, while polyunsaturated and monounsaturated fatty acids increased, perhaps due to a favouring of vegetable sources of fat over animal sources. Due to the shift from animal to vegetable sources of fat, the decrease in egg purchases and the decrease in red meat consumption, the cholesterol content of the diet fell.

With regard to minerals, apparent calcium and phosphorus consumption remained stable (Appendix II, Table 4). Due to changes in foods selected for consumption, the amount of sodium inherent in the Canadian food supply decreased between 1972 and 1983 (Appendix II, Table 4) and remained relatively stable in subsequent years. However, the data exclude discretionary use of table salt as well as salt used in food processing. As a result, the actual consumption of sodium is significantly higher than reported in these data.

The availability of iron from the Canadian food supply fell, due primarily to a reduction in the use of edible offal (liver, kidney, etc.). Potassium availability increased marginally due to increased use of dairy products, fruits and vegetables. Vitamin A availability increased by 20%, reflecting increased consumption of vegetables. Ascorbic acid exhibited the most substantial increase in availability (28%). This may be attributed to the increased consumption of citrus fruits and juices. The apparent consumption of thiamin and riboflavin increased, reflecting shifts in availability of cereals, fruits and vegetables, poultry and dairy



products. Similarly, availability of folacin increased, due to increased availability of fruits and vegetables.

While the gross amount of macronutrients available for consumption from the Canadian food supply remained relatively constant from 1972 to 1986, year-to-year variations in supplies of these as well as vitamins and minerals can be attributed to changes in both the type and amounts of specific foods demanded by consumers, as well as changes in the nature of the foods themselves.

## Sources of Nutrients

Sources of nutrients for Canadians were determined from calculations based on Nutrition Canada Survey data and from calculations of nutrient availability in the Canadian food supply.

In the first instance, an estimate of the major sources of energy and nine nutrients was made from the portion sizes and frequency of mention of the foods consumed according to the results of the Nutrition Canada Survey. The foods were grouped into 115 composites (Appendix III, Table 1), with the most frequently mentioned food in each composite chosen to represent the nutrient content. For example, "milk, whole" represented all whole milks, such as goat, human and whole cow's milk. Nutrient values of the representative foods were then calculated using the 1988 edition of the Canadian Nutrient File and the average portion sizes as reported in the Nutrition Canada Survey.

The 50 food composites most frequently mentioned by the persons interviewed are shown in Appendix III, Table 2, while Table 3 shows the percentage of persons who consumed the first 50 food composites, in descending order. Appendix III, Tables 4 to 13 illustrate the sources of energy, total fat, total saturated fatty acids, total monounsaturated fatty acids, total polyunsaturated fatty acids, cholesterol, calcium, iron, sodium and dietary fibre in the composites, in descending order of contribution. These lists highlight the importance of serving size in nutrient contribution. For example, pasta (macaroni and cheese), topped several lists

because of the large portion size commonly consumed. Thus, these lists were to target foods and food groups for recommendations to modify nutrient and food intake.

It must be emphasized that these data merely provide an estimate of the major food sources of energy and nine nutrients, an estimate which was relatively meaningful in 1971-72. However, any changes in food consumption trends since then would change the sequence of listing, as would changes in the portion size consumed. In addition, more appropriate analytical values for the nutrient contents of selected food composites as such, rather than those of the most commonly consumed foods, could alter their relative importance as a dietary source of that nutrient. As previously noted, some shifts in nutrient availability in the food supply have occurred since the Nutrition Canada Survey of 1971-72.

In the second instance, nutrient intakes were examined based on the Apparent Per Capita Food Consumption data and the Family Food Expenditure Survey data. The Apparent Per Capita Food Consumption data tend to overestimate actual intake levels, particularly for food energy, fat and carbohydrates. The Family Food Expenditure Survey data, which is based on food trimmed and/or cooked, represent a closer approximation of actual nutrient intakes, and were thus the primary source for identifying nutrient sources.

Results for the 1972 to 1986 period indicate that the food supply provides adequate levels of all nutrients needed to meet the recommended nutrient intakes of the Canadian population (Appendix II, Table 4).

In 1986, the major sources of carbohydrates were cereal and bakery products (44%), with the majority as bread, flour, rice and pasta (Appendix II, Table 7). Fruits and vegetables provided 20% of carbohydrates, with vegetables increasing in importance as a carbohydrate source. Sugar and soft drinks provided 18% of the carbohydrates in the food supply.

Approximately two-thirds of protein in the diet is of animal origin, with 65% of this from meat (42.5%), poultry (10.6%) and fish (5.9%) and 35%



from dairy products. Poultry is becoming an increasingly important contributor to protein intake.

The level of fat in the diet was approximately 38% of total energy. Animal sources, namely meat, poultry, fish and dairy products were major sources. Twenty-five percent of the fat in the diet is from vegetable sources, reflecting the significance of margarine and oils used in deep-fat frying and in salad dressings. The fatty-acid composition of the Canadian food supply reflects these sources. Over 40% of cholesterol is derived from eggs, followed by that derived from meat, poultry and fish (29%) and dairy products (18%).

With regard to minerals, dairy products represent primary sources of calcium (61%) and phosphorus (36%). Secondary sources are cereals and bakery products (14%). Enriched bakery and cereal products furnish 43% of iron, while 17% comes from meat, fish and poultry. Processed foods account for about 50% of sodium in the diet, excluding discretionary use of table salt. Meat, fish and poultry contribute 18%, and dairy products 12%, of dietary sodium. Dairy products contribute 22% of the dietary content of potassium, followed by vegetables (9%), meat, fish and poultry (5%), fruit (14%) and coffee and tea (7%).

Vitamin sources are similarly widespread in the Canadian food supply. Vegetables and their oils supply 46% of dietary vitamin A as beta-carotene. Major contributors of pre-formed vitamin A include dairy products, butter and eggs. Ascorbic acid is found mainly in fruits and their juices (54%) and in vegetables (31%). The B-vitamins (thiamin, riboflavin and niacin) come mainly from bakery and cereal products, with other major sources being pork (thiamin), dairy products (riboflavin) and meat, fish and poultry (niacin). Folic acid is ubiquitous, with 53% coming from cereal and bakery products and vegetables.

These data indicate that the food supply provides nutrients at levels sufficient to meet the recommended nutrient intakes of the Canadian population.

## Consumption Trends vs Nutrition Recommendations

A diet that reflects the proposed nutrition recommendations of the Scientific Review Committee would be expected to contain:

- essential nutrients in amounts specified in the updated recommended nutrient intakes;
- energy sufficient to maintain a healthy weight when balanced with physical activity (for adults, 1800 kcal, or 7600 kJ, was considered to be the minimum energy intake, due to the difficulty of achieving recommended intakes of nutrients at lower energy levels);
- no more than 30% of energy from fat (33 g/1000 kcal or 39 g/5000 kJ) and no more than 10% energy from saturated fat (11 g/1000 kcal or 13 g/5000 kJ);
- at least 55% energy as carbohydrates (138 g/1000 kcal or 165 g/5000 kJ) with an increase in complex carbohydrates;
- less sodium than is now consumed;
- no more than 5% energy as alcohol or two drinks per day, whichever is less; and
- no more caffeine than the equivalent of four regular cups of coffee per day.

Consumption trends were analyzed in light of these statements. As described in Section 4 of this report, significant changes have occurred since 1972 in the amounts of various food items available for consumption, which in turn are reflected in the nutrient intakes of the population. The data from the Family Food Expenditure Survey (FFES) (Appendix II, Table 6) were used for estimating the nutritional quality of the Canadian diet for reasons cited in Section 3.

As stated previously, the Canadian food supply appears to have sufficient energy and nutrients to meet recommended nutrient intakes. The apparent average energy intake is in excess of 1800 kcal (7600 kJ) and has decreased slightly since the Nutrition Canada Survey was conducted. Bakery products and fats and oils contribute the greatest percentage of energy to the diet. Foods consumed away from home are also a major energy source.

Apparent protein intakes have increased slightly and make up, on average, 15% of energy, a figure which is in line with the upper limit of the updated recommended intake for this nutrient. Two thirds of this protein is from animal sources, which could contribute to excessive fat intakes and influence the percentage of energy derived from carbohydrates. By virtue of the quantity consumed, bakery products are also a major source of protein.

Apparent fat intakes have decreased since 1974; however, the level of 38% still exceeds the recommended level of 30% of energy from fat. The shift in food sources has resulted in coincidental declines in saturated fat and cholesterol intakes. However, saturated fat still makes up an average of 13% of energy, which is greater than the recommended level of 10%, and daily consumption of cholesterol averages 442 mg.

Apparent carbohydrate intakes have increased slightly since 1974 to 48% of energy. The data indicate that this change can be attributed to increases in complex carbohydrates from rice, pasta, cereal products and vegetables, as well as simple carbohydrates from such sources as soft drinks and alcohol. The change in complex carbohydrate intakes since 1974 is a positive step in light of the recommendation to increase intakes of these macronutrients. However, the level of consumption is below the recommended level of 55% of energy. As would be expected, fibre intake is dependent on complex carbohydrate consumption.

Disappearance data (Appendix II, Table 4) on sodium is far from complete, since it excludes discretionary use of table salt and salt used in food processing. The apparent decrease in sodium intake through change in food choices since 1972 could be offset by the amount of sodium added at the table and in food preparation, both at home and by the food industry. The fact that bakery products, miscellaneous foods and prepared foods are the prime sources of sodium in the diet and that a reduction in sodium intake is being recommended means that industry is targeted as a source of change in the use of this nutrient.

Precise data on alcohol ingestion are lacking. The decrease in the apparent availability of beer, ale, stout, porter and distilled spirits is positive in view of the recommendation for no more than 5% of energy intake as alcohol. The increased apparent availability of wine could be cause for concern in terms of adhering to the recommendation.

Caffeine intakes could not be directly identified from the databases accessed by the Task Group. It is known that consumption of some sources of caffeine, namely coffee and certain soft drinks have increased, while others, such as tea and cocoa, have declined. The net effect of these changes cannot be ascertained.

According to Family Food Expenditure Survey data, apparent intakes of calcium, iron, phosphorus, potassium, vitamin A, vitamin C, thiamin, riboflavin, niacin and folacin exceed the amounts recommended.

## Predicted Impact

Any changes in the Nutrition Recommendations for Canadians resulting from the deliberations of the Scientific Review Committee (SRC) will have a profound and varied impact on how Canadians deal with food. Because of this, a multisectoral approach will be required to facilitate compliance. For example, revised recommendations may dictate drastic changes in food choices by consumers, in breeding practices and/or choice of species, cultivar, etc. by producers and in the development of new specialized products and improved preservation techniques by the food industry. Using as an example the combination of a recommendation for a decrease in the percentage of energy derived from fat and a recommendation for an increase in the consumption of complex carbohydrates, the following modified practices might be anticipated:

- *Changes in food choices:* The consumer would have to be advised to decrease the intake of foods such as ground beef (other than the low-fat variety), sausages, butter, margarines, salad oils, most cheeses, ice cream, nuts, sauces and gravies, and to increase consumption of

whole-grain cereals, vegetables, pasta and fruit. As noted in Appendix IV, these changes could result in a slight increase in expenditure.

- *Food supply:* The producer would have to pay special attention to breeding programs which would minimize the fat content of animal tissues, including milk. In addition, the nature of the complex carbohydrates contained in cultivars of grains, vegetables and fruit would require due consideration in order to ensure the most desirable content of dietary fibre.
- *New product development:* The food manufacturer would be required to design new low-fat products (such as cheese, yogurt, sausages and wieners) that are consumer-acceptable and in line with the general thrust of the updated Nutrition Recommendations. The design of food products stressing the desirable complex carbohydrate components of plant products would also have to be considered. Other aspects of the Nutrition Recommendations for Canadians, such as a restriction in the daily intake of sodium, will necessitate appropriate changes in the choice of foods or food products, as well as an attempt to alter the supply of these components in foods and to design new products in which their content is minimized.

## 5.

## Conclusions and Recommendations

The Task Group on Food Consumption investigated food consumption patterns and buying practices of Canadians. The databases accessed represented the best sources of national data available. However, they provided estimates only and could not provide more precise data on specific segments of the population. In addition, no recent national food consumption data were available.

Given these limitations, the Task Group concludes that the food supply appears to be adequate in supporting the Recommended Nutrient Intakes for the population. Shifts in food consumption have occurred since 1972 which are reflected in changes in estimated nutrient intakes. Some of these changes are in line with proposed nutrition recommendations, while others contradict them. For example, the overall reduction in fat intake to 38% of calories, and the shift from high-fat foods to those with lower fat content in categories such as milk and meat, are considered to be positive steps toward compliance with the proposed nutrition recommendations. On the other hand, the continued excessive fat intake and preference for higher-fat choices in categories such as cheese and ice cream are discouraging. Other patterns of consumption of a favourable nature are the increase in consumption of cereal products and the favouring of vegetable sources of fat over animal sources. The Task Group concludes that the population as a whole is taking steps to follow the Nutrition Recommendations, but that more changes in buying, food consumption and food preparation practices are required for the implementation of the Nutrition Recommendations.

Increases in the amount of foods consumed outside the home and changes in the food preferences of fast-food outlet patrons leads to the recognition of the entire food industry as a powerful influence on food consumption and nutrient intake.

Implementation of the revised Nutrition Recommendations will influence food consumption and buying practices of consumers and will mean changes in all segments of the food industry, from agriculture to food service.

The Task Group on Food Consumption therefore recommends that:

- the federal government establish a national nutrition monitoring and surveillance system (for example, surveys of food consumption and nutrient intakes of the total population and of targeted segments);
- Health and Welfare Canada establish a system of compiling, evaluating and tabulating all reports of food and nutrient intakes of Canadians;
- more emphasis be given to information and education programs designed to inform Canadians of the sources of nutrients such as fat in the food supply;
- the food services and hospitality industries be encouraged to form partnerships with nutrition educators for the dissemination and implementation of the Nutrition Recommendations;
- the food industry be encouraged to modify or develop products that are supportive of the revised Nutrition Recommendations.





# Appendix I

## Task Group on Food Consumption

### Terms of Reference

To provide support to the Communications/ Implementation Committee in recommending the expression of updated nutrition recommendations as dietary advice for the consumer by:

- 1) providing to the Communications/ Implementation Committee the most up-to-date information on Canadians' food consumption patterns and buying practices, including foods eaten away from home, broken down by age and gender where possible;
- 2) identifying the major food sources of nutrients of public health significance based on input from the Scientific Review Committee;
- 3) analyzing the updated Nutrition Recommendations as provided by the Scientific Review Committee in light of current food consumption patterns and buying practices, food availability, etc.;
- 4) projecting the impact of the updated Nutrition Recommendations on the food supply and the development of new products; and
- 5) preparing progress reports and a final report for submission to the Communications/ Implementation Committee.



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# Appendix II

## Food and Nutrient Trends, 1972-86

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# 1.

## Executive Summary

**B**ecause of the lack of comprehensive, current data on the actual nutritional status of the Canadian population (Nutrition Canada, conducted in 1970-72, being the last such survey) other sources of data had to be developed.

Apparent Per Capita Food Consumption data can be used in the calculation of long-term annual estimates of trends in the nutrients available to Canadians from the food supply. Family Food Expenditure Survey data supplement this information by providing a basis for calculating the nutritional value (of a cooked, edible portion) of foods bought by Canadians. Together, these data provide an overview of changes in nutrient availability over time, as well as an estimate of the level and dietary sources of food energy, macronutrients, vitamins and minerals to Canadians.

While detailed data on food and nutrient trends from 1972 to 1986 are provided in the attached paper, highlights are as follows:

- 1) Canadian consumers are becoming much more diversified in the selection of foods. As such, they are moving away from reliance on traditional foods prepared in traditional ways and are including more ethnic foods and exotic fresh produce. The perceived healthfulness and freshness of foods are important criteria in food selection. At the same time, however, high-fat food items, such as gourmet yogurts, ice creams, desserts and snack foods, many of which are deep-fried, are gaining popularity. These trends seem to suggest that Canadian consumers are looking for new and different foods to incorporate into their daily diets. At the same time, they appear to be uncertain as to how to achieve a healthy intake, abandoning foods perceived as being "bad" for other foods that may not

be better dietary choices (for example, changing from fluid whole milk to partly skimmed and skim milk, but at the same time increasing consumption of cheese.) This seems to indicate the need for greater nutrition education and nutrition labelling in Canada.

- 2) In terms of food consumption patterns from 1972 to 1986:
  - red meat consumption was stable;
  - poultry and fish consumption increased;
  - discretionary use of eggs continued to decrease, although use of eggs in processing increased;
  - the shift from fluid whole milk to partly skimmed and skim milk continued; however, consumption of cheeses, especially variety cheeses such as Brie and Camembert, and fruit-flavoured yogurt continued to increase;
  - the shift from animal to vegetable fats seemed to stabilize, with vegetable fats constituting the primary source of fats and oils;
  - cereal product consumption continued to be strong, especially consumption of rice and pasta;
  - a major trend towards fresh produce (especially exotic variety) continued, followed by frozen produce — canned fruits and vegetables were becoming less popular;
  - consumption of non-alcoholic beverages remained stable, the exception being the consumption of soft drinks, which continued to increase substantially; and
  - although it was stabilizing, foods consumed away from home represented a significant proportion of total food intake for many population groups.

In terms of nutritional quality, it appears that the Canadian food supply is generally adequate and that Canadians, on average, are purchasing foods sufficient to meet the current recommendations set out in the Recommended Nutrient Intakes for Canadians. High levels of total fat in the diet (greater than the 35% of total calories which was recommended by the Committee on Diet and Cardiovascular Disease) would appear to be confirmed. It must also be noted that these data represent food available for consumption by "average" Canadians. In order to investigate population groups who may be at potential risk of nutrient inadequacies or excesses, dietary surveys are needed.

## 2.

# Overview: The Data

Since the Nutrition Canada Survey of 1970-72, no comprehensive set of data on the actual food intake and subsequent nutritional status of the Canadian population have been available. As a result, it has been necessary to use other types of data to estimate the amount of foods consumed, and thus the nutritional quality of the Canadian diet, in the years following the Nutrition Canada Survey.

Two such types of data are used in the examination of food and nutrient trends from 1972 to 1986. They are the Apparent Per Capita Food Consumption data and the Family Food Expenditure Survey data, both compiled by Statistics Canada. While these data are of limited use in determining the nutritional status of individuals within the Canadian population, and perhaps more importantly in identifying population subgroups which may be at risk, they are the only data available. As a result, it is important to know the limitations of these two types of data in order to interpret more accurately the results obtained from their use.

## Apparent Per Capita Food Consumption Data

Apparent Per Capita Food Consumption data (catalogue numbers 32-229 and 32-230) are annual time-series data on the amounts of basic foods available to the Canadian population. They are calculated by Statistics Canada using supply and disposition balance sheets; the quantities of basic foods available for consumption are determined by subtracting data on exports, ending stocks, non-food use, manufacturing, etc., (disposition data) from data on production, beginning stocks and imports (supply data). The remainder is considered to be available for consumption by all Canadians.

In these data, losses of food during processing or marketing are not accounted for. For example, meat is reported on a carcass basis and bakery products such as bread are reported in terms of individual ingredients rather than as a finished, processed good. Food losses occurring in the home during food preparation and cooking are also excluded from the calculations. As a result, the data tend to *overestimate* the amount of food actually consumed by the population. *They do, however, provide an indication of amounts of basic foods and nutrients available to Canadians in a given year and changes in these amounts over time.*

Based on Apparent Per Capita Food Consumption data, Agriculture Canada computes the annual quantities of nutrients available to Canadians, using the Agriculture Canada Nutrient Assessment Program (AGNAP). In this way, *an assessment of gross trends in the availability of nutrients to Canadians from the food supply over the years can be ascertained.* However, due to the gross nature of these data and the fact that the quantities of food do not reflect food as typically purchased by consumers, *the primary use of these data is to determine annual changes in the levels of nutrients and in their sources in the diet, rather than as a means of obtaining the absolute level of nutrients available for consumption.* The absolute levels of some nutrients, especially food energy and carbohydrates, tend to be overestimated, while those for dietary sodium (for which a major source is table salt) are underestimated, since discretionary use of salt at the table and sodium used in processing are excluded.

## Family Food Expenditure Survey Data

The second source of data used to determine levels of food consumed by Canadians is the Family Food Expenditure Survey. This survey is conducted approximately every two to four years by Statistics Canada in order to determine



baseline data on the quantities of foods bought by Canadian families for at-home consumption. These data are obtained through the use of two consecutive weekly diaries. The survey also provides information on the number of meals Canadians eat away from home. These data provide an assessment of food available for consumption by Canadians. *The most recent survey was conducted in 1986. As a result, any comparisons made in this paper using Family Food Expenditure Survey data will be between the 1974 and 1986 surveys.*

Because the data are reported as purchased at the retail level, they are considerably closer to actual intake — only food losses in the home are not accounted for. In addition, foods are reported in the form in which they are bought (for example, beef is reported by cut rather than as a total carcass weight), making assessment of food intake more accurate.

The major drawback of these data, however, is the fact that the quantities of foods bought are reported as a total per family. As a result, *the quantities of food consumed by individual family members or the identification of "at-risk" individuals within the sample population are not possible.* In order to estimate per-capita daily consumption from Family Food Expenditure Survey data, the quantities of food bought weekly were divided by family size, and then by seven.

The AGNAP is used to calculate the quantities of 21 major nutrients in the foods purchased and the sources of these nutrients in the diet. In order to most closely approximate actual consumption, quantities of individual foods are adjusted for trimming and cooking losses (yield data were obtained from Canadian sources when available; otherwise, they were extracted from USDA Handbook No. 102. No adjustment could be made, however, for table wastes and leftovers discarded, uneaten and fed to pets). In addition, a dining-out factor was developed to account for meals eaten away from home. (The dining-out factor adjusts the quantities of food bought to equal 21 meals per week, by taking into account

the number of meals purchased away from home, received from others and served to guests). As a result, *the calculation of nutrient intakes based on Family Food Expenditure Survey data provides the closest estimation of the nutritional quality of the Canadian diet available for recent years (1986) and of the importance of specific foods and food groups to the diet.*

### 3.

## Food Trends

### Food Availability for Consumption in Canada, 1972 to 1986

In order to compare the results obtained with those of the Nutrition Canada Survey, examination of food availability data begins in 1972. The most recent data (1986) and data for selected interim years, have been included to provide more up-to-date estimates.

Significant changes have occurred between 1972 and 1986 in the amounts of various food items available for consumption by Canadians (Table 1). These changes can be attributed to variations in relative prices of foods and the alternatives, changes in real personal disposable income (that is, the income Canadians have to spend after taking into account inflation and taxes), shifts in the tastes and preferences of Canadian consumers and changing health concerns.<sup>8</sup>

#### Meat, Poultry, Fish and Eggs

##### Red meats

Between 1972 and 1986, annual availability of red meat decreased from approximately 77 to 72 kg/person per year, peaking in 1976 to about 82 kg/person. Between 1977 and 1986, the gradual demographic change in Canadian consumers, the effects of unemployment, the reduction in the proportion of available personal income spent on food and the trend towards

meals in fast-food outlets (where chicken is selected frequently) all contributed to a reduction in the consumption of red meat.

- *Beef* — Beef availability peaked at 51.4 kg/person in 1976, a year characterized by particularly high production and imports, and thus relatively low prices. From 1977 to 1986, however, beef availability to Canadian consumers remained relatively unchanged, averaging 38 to 40 kg/person per year.
- *Pork* — From 1972 to 1986, pork availability fluctuated. Lowest levels during this period were recorded from 1975 to 1977, at 24 to 25 kg/person per year. Pork availability peaked at 31.3 kg/person in 1980, due mainly to substantially higher levels of production. In 1986, however, availability fell to a level of 27.9 kg/person because of greater exports.
- *Other meats* — The availability of other meats (such as veal, lamb, mutton and offal) decreased from 5.7 to 4.4 kg/person over the 1972 to 1986 period. The amount of veal consumed by Canadians fell because of lower production and relatively low imports. Lamb and mutton production was also lower in 1986 than it was in 1972-73, since imports, an important source of supply, declined.

<sup>8</sup> Additional discussion of the relationship between socio-economic factors and food consumption can be found in the following publications: Oral Jr. Capps and Benjamin Senauer, eds. *Demand Analysis: Implications for future Consumption*. Sponsored by the S-165 Southern Regional Research Committee and the Farm Foundation. (Blacksburg: Virginia Polytechnic Institute and State University, August 1986). Raunika, Robert, and Huang, Chung-Liang, eds. *Food Demand Analysis: Problems, Issues, and Empirical Evidence*. (Ames: Iowa State Press, 1987.)

### *Poultry*

Canadian availability of poultry for consumption increased since 1972, when poultry availability was approximately 20 kg/person. By 1986, it was near record levels, at 26.2 kg/person. Increased availability of chicken was almost solely responsible for this trend (a 47% increase from 1972 to 1986), since only minor changes were noted in the availability of turkey and other fowl. Factors contributing to the increase of chicken in the food supply include its price and leanness and, in recent years, its substantially greater use in fast-food outlets.

### *Fish*

Annual fish availability remained relatively unchanged at approximately 7 kg/person, although preliminary figures for 1986 indicated greater availability. However, there has been a change in the type of fish consumed — Canadians are buying much more fresh and frozen fish, and less canned or dried fish.

### *Eggs*

Despite generally smaller price increases for eggs compared to other protein sources, the availability of eggs for consumption by Canadians fell almost 16% to 11.8 kg/person in 1986. The use of eggs in processed and prepared foods has increased substantially, indicating that discretionary use has declined even more dramatically than it would appear.

### **Dairy Products**

Between 1972 and 1986, annual total fluid milk consumption remained relatively stable at 95 to 100 L/person). However, consumers have been reducing their consumption of whole (3.25% fat) milk in favour of lower-fat milks. This shift away from whole milk is in part a reflection of the desire of Canadians to reduce the fat content of their diet.

The availability of cheese to Canadians increased dramatically between 1972 and 1986, from 5.9 kg/person to 9.8 kg/person. Cheddar and processed cheese availability generally increased over this period; however, much of the increase

was among variety cheeses. Variety cheese availability has gone up from 1.4 kg/person in 1972 to 4.4 kg/person in 1986. Much of this increase can be attributed to the increased use of cheeses as a snack food by Canadians, the significantly greater use of cheeses in manufactured and fast-food products (such as pizza), and the increased preference for specialty and imported cheeses.

The removal of the government subsidy on skim milk powder in 1978 led to a substantial drop in its demand by Canadians to a level of 1.8 kg/person in 1986.

Canned milk (evaporated and condensed) availability also fell from 1972 to 1986, by 49%. A shift from whole to partly skimmed canned milk is also noted during this period, reflecting the desire by consumers to reduce dietary fat. The availability of ice cream remained relatively steady, in the 12 to 12.7 L/person per year range.

Finally, the annual per-capita availability of yogurt for consumption increased dramatically from about 0.6 L/person in 1972 to 2.8 L in 1986. Much of this increase can be attributed to the introduction of fruit yogurts.

### **Fats and Oils**

Per-capita annual availability of fats and oils remained relatively stable throughout much of the 1972 to 1986 period. However, a shift from animal fats (butter and lard) to vegetable fats (margarine, shortening and shortening oils and salad oils) has been observed. In 1972, Canadian availability of fats and oils was, on average, 6.6 kg/person of animal fats and 15 kg/person of vegetable fats; in 1986, it stood at 4 kg/person and 19.5 kg/person respectively. This shift from animal to vegetable fats can largely be attributed to a desire by Canadian consumers to reduce the amount of saturated animal fats in their diet. The relatively lower prices of some vegetable fats, their use in deep-fat frying (especially by fast-food outlets), and their convenience (for example, "soft" margarines) have also contributed to the decline in animal fat use, and the particular decrease in butter consumption.

### Cereals

Cereal product availability increased somewhat, rising from 68.4 to 72.5 kg/person per year from 1972 to 1986. Wheat flour availability remained relatively constant, in the 58 to 60 kg/person range. However, the availability of rice almost doubled, going from 2.8 to 4.5 kg/person, which is perhaps partly due to the rising Asian population in Canada.

### Sugar and Syrups

Sugar availability declined somewhat from the 1973 peak of 47.2 kg/person to 42.6 kg/person in 1986. The increased consumer demand for "lite" and artificially sweetened foods, and the substantially greater use of high-fructose corn syrups (HFCS) in processed foods, are probable factors responsible for the reduced use of sugar in manufacturing.

### Pulses and Nuts

The per-capita availability of pulses and nuts nearly doubled over the 1972-86 period — from 4 kg/person to 7.6 kg/person per year. Much of the increase has been due to increased consumption of nuts, including peanuts used in the manufacture of peanut butter.

### Fruits

Availability of fruits increased between 1972 and 1986, from 108.7 kg to 122.2 kg/person per year. Since 1972, the availability of fresh fruit and fruit juices has recorded the largest gains, from 54.3 to 62.7 kg/person and from 25.5 to 38.8 kg/person respectively. However, more "exotic" fresh fruits, such as kiwi, mangoes and papaya, are being imported for consumption in addition to the traditional fruits consumed by Canadians. Citrus fruit availability has been steadily increasing since the early 1960s. Much of this increase is the result of higher orange juice consumption by Canadians. No obvious trends are noted for other types of fresh citrus fruit and juices. At the same time, consumption of frozen and other fruits declined, while that for canned remained relatively stable.

### Vegetables

The availability of vegetables for consumption increased dramatically over the 1972 to 1986 period, from 125.4 to 148.8 kg/person per year. This is largely the result of an increased demand by Canadian consumers for fresh produce, the availability of which rose 26.6% from 1972 to 1986 — consumers are demanding more fresh vegetables because they perceive them to be healthier than comparable processed forms. The large number of retail outlets specializing in fresh fruit and vegetables and salad bars in restaurants are evidence of this trend.

Frozen vegetable availability has also increased from 4.2 to 6.8 kg/person per year. Much of this increase has been at the expense of canned vegetables, for which availability has fallen from 12.1 to 4 kg/year over the same period.

### Beverages

- *non-alcoholic* — Coffee availability remained stable since 1972, with an average of 4.4 kg/person, while the availability of tea and cocoa declined. In contrast, soft drink availability increased steadily. In 1974 (the first year for which data on soft drink sales are available), slightly more than 62.2 L/person per year was available; by 1986, the figure had reached 83.9 L. Because of the aggregate nature of the soft drink data available, industry trends towards greater varieties and the increased use of "diet" or artificially sweetened soft drinks cannot be quantified.
- *alcoholic* — Between 1972 and 1986, the availability of ale, beer, stout and porter and distilled spirits for consumption decreased marginally, while that for wine increased significantly, from 5.3 to 10 L/person per year.

### Food Purchased for At-Home Consumption, 1974-86

Quantities of food purchased for at-home consumption changed between 1974 and 1986, as reported by Family Food Expenditure Survey data. These trends are similar to those observed from Apparent Per Capita Food Consumption



data, although the extent of the trend may not be the same due to the nature of the reporting (see "Overview: The Data" for additional details).

### **Meat, Poultry, Fish and Eggs**

Canadians bought slightly less red meat in 1986 (50 kg), especially beef and pork (Table 2), than they did in 1974 (53 kg/person). The quantity of processed meats purchased increased over the same period. Egg purchases fell from 12.5 to 11.2 kg/person.

On the other hand, consumers were buying more poultry (18.3 kg/person in 1986, compared to 14.4 kg/person in 1974), with most of the growth centred on chicken. Fish purchases also increased between 1974 and 1986 from 4.1 kg/person per year to 6.6 kg/person per year.

### **Dairy Products**

Within dairy products, cheese purchases increased between 1974 and 1986 from 5.8 kg/person to 7.4 kg/person. Fluid milk purchases also increased, especially in the low-fat milk category — partly skimmed milk represented the major type of fluid milk purchased by Canadian consumers. Canadian consumers also bought significantly greater quantities of yogurt in 1986 than they did in 1974, but substantially less powdered skim milk.

### **Fats and Oils**

The food purchase data correspond to food availability data; consumers shifted from animal-origin fats to vegetable-origin fats.

### **Bakery and Cereal Products**

The quantity of bakery products bought by Canadians fell from 52.9 kg/person to 42.4 kg/person between 1974 and 1986, while cereal product purchases increased from 18.8 kg to 23 kg/person over the same period. Much of the growth in cereal purchases was noted in the rice and pasta categories.

### **Fruits and Vegetables**

Fruit and vegetable purchases increased between 1974 and 1986, especially for fresh produce and fruit juices (particularly orange juice). However, purchases of canned and frozen fruit fell over the same period.

### **Non-alcoholic Beverages**

While the purchase of coffee and tea was relatively stable between 1974 and 1986, significant increases were recorded in the quantity of other beverages bought by Canadians, especially soft drinks, which increased from 39.3 L/person to 48.2 L/person per year.

## **Food Consumption Levels — Nutrition Canada Survey, 1972**

The mean daily Canadian intake of foods, by major food group, as calculated from the Nutrition Canada Survey, is provided in Table 3, along with an estimation of annual intakes. In comparison with the quantities of food reported as purchased in the 1974 Family Food Expenditure Survey (the survey most comparable to the Nutrition Canada Survey), the following observations can be made.

The quantity of meat, poultry, fish and eggs reported in the Nutrition Canada Survey (57.3 g/person per year) is significantly lower than that reported in the Family Food Expenditure Survey data; however, these quantities are assumed to represent the cooked, edible portion as opposed to the "at-retail" level purchases represented by the Family Food Expenditure Survey data. On the other hand, the quantity of cereal and bakery products (94.5 kg/person per year) and nuts and legumes (4.4 kg/person per year) is somewhat higher in the Nutrition Canada Survey. This may reflect gains in the weight of cereals that must be prepared, such as rice, pasta and legumes (weight gains due to the absorption of water during cooking).

The quantity of fruit consumed by the average Canadian in the Nutrition Canada Survey (86.5 kg/person per year) is somewhat higher than that reported in the 1974 Family Food Expenditure Survey. The quantity of vegetables (82.9 kg/person per year) and fats and oils (8.4 kg/person per year) is lower in the Nutrition Canada Survey data. This is again probably due to weight gains during food preparation.

The quantities of dairy products consumed are not directly comparable because of the differences in units of measure.





## 4.

## Nutrient Trends

## Nutrient Availability from the Canadian Food Supply, 1972-86

Several nutrition implications arise from the commodity trends outlined in the previous section. In particular, the proportion of calories derived from dietary fat has decreased slightly, that from protein sources has remained relatively stable, and that derived from carbohydrates has increased over the 1972 to 1986 period.

In general, the Canadian food supply in 1986 provided less saturated fats, cholesterol, iron, dietary sodium and niacin than it did in 1972 (Table 4 provides data for selected years in the 1972 to 1986 period). On the other hand, it provided more polyunsaturated fats (including linoleic acid), vitamin A, ascorbic acid, thiamin and folacin than it did in 1972. Yearly fluctuations can be observed for food energy, monounsaturated fat, carbohydrates, protein, calcium, phosphorus and potassium availability. These changes reflect shifts in consumer patterns. It should be noted, however, that nutrient availabilities calculated from Apparent Per Capita Food Consumption data *tend to overestimate actual intake levels, most notably for food energy, fat and carbohydrates*. As a result, these data are used to indicate possible trends in the nutrient rather than actual levels of intake by the population as a whole, or by segments of the population.

## Macronutrient Levels, 1972-86

- *food energy* — The amount of food energy available for consumption by Canadians fluctuated from year to year, falling slightly (by 6.5%) from 1972 to 1986. Availability peaked in the early to mid 1970s. Remaining the primary source of food energy in the Canadian diet, carbohydrates increased from 47% to 49%

between 1972 and 1986. Energy from protein increased from 11% to 12%, while that from fat fell from 42% to 40%.

- *carbohydrates and dietary fibre* — The increased contribution of carbohydrates to food energy content can be attributed to an increase in the consumption of cereals (notably rice), which account for more than one-third of all dietary carbohydrate consumption. (While excluded from the calculations due to the lack of data before 1974, soft drinks and alcoholic beverages contribute significantly to food energy and dietary carbohydrate consumption as well as the phosphorus content of the Canadian diet.)

The share derived from sugars dropped from 34.9% to 31.3% (Table 5). This reflects the increase in artificially sweetened food products in the Canadian marketplace and the decrease in the use of granulated sugar by both Canadian consumers and food processors; high-fructose corn syrups (HFCS) replaced much of the sugar previously used in manufacturing.

On the other hand, the relative importance of vegetables as a source of carbohydrates increased slightly; in 1972, vegetables accounted for 9.5% of the available carbohydrates, compared to the figure of 11% in 1986.

The availability of dietary fibre from the Canadian food supply changed little from 1972 to 1986.

- *protein* — The amount of dietary protein available from the Canadian food supply increased marginally since 1972. This growth can largely be attributed to the higher availability of dairy products, which contributed 22.7% of protein in 1986, compared to 20.7% in 1972. In addition, the

protein contribution by meat, poultry and fish rose from 38.7% recorded in 1972 to 39.2% in 1986, largely as a result of more poultry becoming available to consumers. Partly offsetting the increased importance of these two categories of foods was the reduced contribution of eggs.

- *fats* — The share of energy derived from dietary fats was lower in 1986 than it was in 1972, since the total fat content of the food supply decreased by 12.4%. This decrease can be attributed in part to a drop in red meat availability combined with the production of leaner beef and pork carcasses.

While the meat, poultry and fish, fats and oils and dairy products groups account for about 90% of all fat in the Canadian diet, the relative importance of each of these food groups changed over time. Between 1972 and 1986, the proportion from the fats and oils groups rose from 41.3% to 44%, and that from dairy products increased from 11.4% to 14.7%. The share of dietary fat obtained from meat, poultry and fish dropped from 38.7% to 31.3%, reflecting the trend towards leaner beef and pork carcasses and the increased popularity of poultry and fish.

With the overall decrease in the apparent fat content of the Canadian diet and the shifts in food group contributions, the fatty-acid composition of the Canadian food supply also changed. Saturated fats contributed 39.6% of total fat in 1972, compared to 34.2% in 1986, while the share of total fat from polyunsaturated fatty acids increased from 10.8% to 13.7%, and that from mono-unsaturated fat from 49.6% to 52.1%. Corresponding to the increased importance of polyunsaturated fatty acids in the Canadian diet are higher levels of linoleic acid (9%). On the other hand, the cholesterol content of the food supply fell consistently over the period (10.7%) as a result of decreased availability of eggs, which are a primary dietary source of cholesterol.

- (i) *saturated fats*: The amount of saturated fat available for consumption by Canadians decreased by 23.6% between 1972 and 1986; peak levels were recorded during the early to mid 1970s because of the relatively high availability of butter, lard and red meat.
- (ii) *linoleic acid*: The linoleic acid content of the Canadian food supply increased by 9% between 1972 and 1986, due primarily to a higher apparent consumption of vegetable fats. Dietary sources, however, remained relatively stable. In 1986, fats and oils (primarily those of vegetable origin) and meat, poultry and fish constituted the major sources of linoleic acid. Within the meat, poultry and fish group, pork and chicken were primary sources. Other foods such as pulses and nuts, dairy products and eggs constituted the remainder of the supply of linoleic acid.
- (iii) *cholesterol*: The cholesterol content of the Canadian food supply decreased by 10.7% since 1972. This trend can largely be attributed to the shift from animal to vegetable sources of fat and to a drop in the annual apparent consumption of eggs. The four major types of foods contributing to cholesterol content are eggs; meat, poultry and fish; dairy products; and fats and oils.

### Mineral Levels, 1972-86

- *calcium and phosphorus* — Since 1972, the amount of calcium and phosphorus available to the Canadian population from the food supply has remained relatively stable, with some year-to-year fluctuations. Dairy products represent the primary sources. Within the dairy products group, the amounts available of partly skimmed (2%) milk, cheese (processed and a variety of specialty cheeses) and yogurt have shown significant gains from 1972 to 1986, accompanied by the reduced availability of fluid whole milk.

- *iron* — The availability of iron from the Canadian food supply fell over the 1972 to 1986 period, due primarily to a reduction in the edible offal (heart, liver, kidney, etc.) supply.
- *sodium* — The sodium that occurs naturally in the Canadian food supply decreased between 1972 and 1983, but has been relatively stable in subsequent years. These figures, however, exclude the discretionary use of table salt by consumers and sodium added to processed food products, both of which are important sources of sodium in the Canadian diet. As a result, the actual availability of sodium is significantly higher. Dairy products, meat, poultry and fish and fats and oils accounted for 73.7% of all dietary sodium in 1986. The proportion of sodium from dairy products increased substantially, primarily because of increased cheese consumption, while sodium derived from fish decreased.
- *potassium* — Potassium levels in the Canadian food supply increased marginally (by 3.5%), although some year-to-year variations can be observed. Fruits and vegetables, especially potatoes, continued to supply almost half of the dietary potassium (45.3%) in 1986. Secondary sources, namely dairy products and meat, poultry and fish, accounted for 19.8% and 15.2% respectively of apparent intake in 1986.

### Vitamin Levels, 1972-86

- *vitamin A* — Vitamin A availability increased by 20.5% from 1972 to 1986. Fruits and vegetables, dairy products, fats and oils and meat, poultry and fish accounted for more than 95% of all vitamin A available to Canadians.

Butter and margarine, which is fortified with vitamin A to the level found in butter, comprise more than 20% of the vitamin A available, although the relative importance of butter as a source of vitamin A has decreased over time.

Dark green and deep yellow vegetables are the primary source of vitamin A in the fruits and vegetables category, accounting for more

than 60% of intake. Tomatoes are a secondary source of vitamin A in the food group, contributing about 14% of the total content of this nutrient in the diet.

Despite the generally increasing availability of meat, poultry and fish from 1972 to 1986, the contribution of these foods to the availability of vitamin A continued to fall; in 1986, this group accounted for 11.1% of availability, compared to 15.1% in 1972. The trend towards reduced availability of edible offal (liver, heart, kidney, etc.), which is a concentrated source of the vitamin, is probably responsible for this trend.

- *ascorbic acid* — Of all the vitamins and minerals being considered, ascorbic acid recorded the most substantial increase in availability to the Canadian population over the period (28.3% increase from 1972 to 1986). This increase can largely be attributed to significant growth in the availability of citrus fruits (especially frozen orange juice) for consumption. Citrus fruits are concentrated sources of ascorbic acid.
- *niacin, thiamin and riboflavin* — Between 1972 and 1986, the amount of dietary niacin available to Canadians decreased by 6% and the amount of dietary thiamin increased by 7%, especially in the 1980s. The riboflavin content of the food supply decreased by 1.9% from 1972 to 1986. These changes reflect shifts in the availability of cereals, fruits and vegetables, and meat, poultry and fish, which are major sources of these nutrients.
- *folacin* — The availability of folacin from the Canadian food supply has fluctuated from year to year, increasing by 7.6% over the 1972 to 1986 period. The share of folacin from fruits and vegetables increased from 40.6% to 45.9% during the same period, making this food group the single largest source of this nutrient. Offsetting these gains was reduced folacin intake from meat and eggs.

### Summary

While the gross amount of macronutrients available for consumption from the Canadian food supply remained relatively constant over the



1972 to 1986 period, year-to-year variations in supplies of these as well as vitamins and minerals can be attributed to changes in both the types and amounts of specific foods demanded by consumers in addition to changes in the nature of the food itself.

Between 1972 and 1986, the amount of dairy products available for consumption by Canadians increased sharply, as consumers demanded more processed and variety or specialty cheeses, fluid partly skimmed (2%) milk and yogurt. The increased availability of these foods offset in part the decline in both total and saturated fats and cholesterol which resulted from the shift from animal to vegetable sources of fat and oil products. In addition, the high demand for dairy products was the basis for the increased calcium, phosphorus, and vitamin A content of the food supply.

Over the 15-year period, the availability of red meats to Canadian consumers decreased, while that of poultry and fish increased. Because of this trend and the increased availability of dairy products, the protein content of the food supply and the importance of protein foods as a source of energy grew slightly. However, as consumers demanded more poultry, and fish and red meats became leaner, the relative importance of this food group as a source of fat, saturated fat and cholesterol decreased. Also of note was the decreasing importance of meat, poultry and fish as a dietary source of vitamin A, due primarily to a significant decrease in the amount of edible offal (liver, kidney, heart, etc.) available for consumption.

Finally, Canadian consumers were demanding more fruits and vegetables, especially fresh produce, in 1986 than they were in 1972. As a result, the relative importance of this food group increased as a dietary source of carbohydrate, ascorbic acid (particularly from frozen orange juice), vitamin A, potassium and folacin. Dark green and deep yellow vegetables became especially significant sources of vitamin A and potassium.

## Nutritional Quality of Food Purchased, on Average, 1986

Highlights of the nutrients purchased by Canadian consumers for consumption in 1986, by food group as well as by individual food product, are outlined in this section. These data are for food that has been trimmed and cooked, and therefore represent a closer approximation of actual nutrient intakes than do food availability data. They do not, however, constitute actual nutrient intakes as obtained from recall and other dietary surveys. Table 6 lists the nutrients available for consumption from foods purchased by the average Canadian, while Table 7 shows the percentage distribution of these nutrients by food group. Tables 9 to 13 provide more detailed data on sources of total fat, sodium, cholesterol, carbohydrate and fibre, both by food group and major food product.

### Macronutrient Levels, 1986

- *food energy* — In 1986, foods purchased by the average Canadian provided 2650 kcal (11 100 kJ) of energy per day. The bulk of the energy available in the diet is from carbohydrate sources (47%), followed by fat (38%) and protein sources (15%).

Foods consumed away from home have become a major source of energy in the diet — these foods constituted approximately one-quarter (27.3%) of total energy in 1986. (This estimate is based on the percentage of meals reported as being eaten away from home by survey respondents.) As a result, the nutritional quality of foods served in food service establishments is noteworthy, especially for those population groups for which meals away from home constitute a primary source of nutrients.

- *carbohydrates and dietary fibre* — In 1986, foods bought by the average Canadian provided 319 g of carbohydrate per person, per day. Cereal and bakery products accounted for almost one-half of all carbohydrates in the diet (44%), with the majority being purchased in the form of bread, flour, rice and pasta. Other major contributors were fruits and vegetables

(20%, especially potatoes, which constitute a quarter of the group total) and sugars, including refined sugar and soft drinks (18%).

Current estimates reveal that the fibre content of the Canadian diet, on average, has increased only marginally:  $14.6 \text{ g} \pm 9.8 \text{ g}$  in the Nutrition Canada Survey<sup>9</sup> to 15 g. Cereal and bakery products account for 38.5% of total dietary fibre, followed by fresh fruits (18%), fresh vegetables (23%) and meat alternates such as pulses and nuts (7.5%).

- *protein* — Foods purchased in 1986 by an average Canadian provided 99 g of protein per day, which is more than double the recommended intake. Two-thirds of this protein was derived from animal sources (65%) and the remainder from vegetable sources. This is considerably different from the situation at the turn of the century, when the ratio of animal to vegetable sources of protein in the diets of Canadians was 1:1.<sup>10</sup> Of the 65% dietary protein from animal sources, meat, poultry and fish (62%) and dairy products (32%) constitute the major food group sources.

- *fats* — The level of fats in the foods bought by the average Canadian in 1986 was 113 grams/day, representing 38% of total energy. Animal sources, namely meat, poultry and fish (23%), dairy products (19%) and butter (8%) were major sources. Also noteworthy is the share from vegetable fats (25%), reflecting the significance of margarine and oils used in deep-fat frying and in salads.

Monounsaturated fatty acids comprised 45% of total fat, followed by saturated fatty acids (38%) and polyunsaturated fatty acids (17%), for a P:S ratio of 0.38.

In 1986, the average Canadian diet contained 442 mg of cholesterol — more than 40% of this was derived from eggs, followed by meat, poultry and fish (29%) and dairy products (18%).

### Mineral Levels, 1986

Total calcium available from foods purchased in 1986 was 1158 g/day. Principal sources included dairy products (61%) and cereal and bakery products (14%), the latter due to the presence of calcium-based additives.

Total phosphorus available for daily consumption (1604 mg) parallels that of calcium. Dairy products are the major contributors (36%), followed by cereal and bakery products and by meat, fish and poultry, each of the latter groups accounting for 20% of the total.

The daily Canadian diet, on average, contained 17 mg of iron, mainly in the form of enriched bakery and cereal products (43%) and meat, fish and poultry (17%).

In 1986, Canadians, on average, had 3321 mg of potassium per day available for consumption. Dairy products, mainly in the form of fluid milk, contributed the largest amounts to the diet (22%), followed by vegetables (19%), meat, fish and poultry (15%), fruit (13.6%), and coffee and tea (7%).

The apparent daily sodium content of the diet was recorded as 3815 mg. Highly seasoned, prepared and miscellaneous foods account for 29% of the sodium, followed by bakery products (21%), meat, fish and poultry (18.5%), and dairy products (12%).

9 Health and Welfare Canada. *Nutrition Canada National Survey*, (Ottawa, 1973).

10 K.K. Carroll, "Review of clinical studies on cholesterol-lowering response of soy protein", *Nutrition Overview* (December 1987), 2:4.



### Vitamin Levels, 1986

On the average, Canadians have 1442 R.E. of vitamin A available to them per day. Vegetables and vegetable oils supply 34% and 12.5%, respectively, of total dietary vitamin A as beta-carotene. Major contributors of pre-formed vitamin A include dairy products (12%), butter (5%) and eggs (3.5%).

Ascorbic acid is also abundant in the diet in the form of fresh and processed fruit, including vitamin C-fortified fruit juices (54%) and vegetables (31%). The total average available ascorbic acid in the diet in 1986 was 114 mg.

Daily levels of thiamin, riboflavin and niacin available in the diet appear adequate, due in part to the enrichment of flour and breakfast cereals. Bakery and cereal products, therefore, are major contributors of these vitamins, supplying 53.5% of thiamin, 23% of riboflavin and 26% of niacin. Other major sources of these vitamins are pork for thiamin (10%), dairy products for riboflavin (39%) and meat, poultry and fish for niacin (38%).

The other B-vitamin examined, namely folacin, is present in a wide variety of foods in the Canadian diet. The average Canadian has 243.5 mcg of folacin available from foods purchased, mainly in the form of bakery and cereal products (27%), vegetables (26%), fruits (14%), meat alternates (11%) and dairy products (10%).

### Summary

The preceding data suggest that the Canadian food supply is generally adequate and that Canadians, on average, are purchasing foods sufficient to meet the current guidelines set out in the Recommended Nutrients Intakes for Canadians. High levels of total fat in the diet (greater than the 35% of calories recommended by the Committee on Diet and Cardiovascular Disease) would appear to be confirmed. It must also be noted that these data represent food available for consumption by the "average" Canadian. In order to identify groups within the population who may be at potential risk for nutrient inadequacies or excesses, dietary surveys are needed.

### A Comparison with Nutrition Canada

Table 8 shows the levels of selected nutrients available for consumption in 1972, based on calculations from AGNAP using food availability and food purchase data and those obtained in the Nutrition Canada Survey. From this comparison, it is evident that nutrient levels calculated from apparent food consumption data tend to be overestimated for virtually all nutrients (the exceptions being calcium and vitamin A). Somewhat lower levels have been calculated for an average Canadian using food purchase data, but these levels are still higher than those obtained from the Nutrition Canada Survey. Food purchase data, however, tend to slightly underestimate protein, calcium, vitamin A and ascorbic acid.

Finally, a comparison of sources of food energy reveals that both food availability and food purchase data tend to underestimate the levels of protein in the diet, while overestimating that of fat. This may be due, in part, to differences in the determination of consumer fat-trimming practices for meats.

Table 1:

Trends in annual per capita food availability,<sup>a</sup> 1972-86

Food	1972	1974	1976	1982	1984	1985	1986
<b>Red meats<sup>b</sup> (kg)</b>	77.2	76.1	81.6	72.0	70.3	71.5	71.9
Beef	42.9	43.6	51.4	40.4	38.3	38.8	39.5
Pork	28.6	28.1	25.1	27.8	27.9	28.5	27.9
Other	5.7	4.4	5.1	3.7	4.2	4.3	4.4
<b>Poultry<sup>c</sup> (kg)</b>	20.2	20.3	20.3	22.6	23.7	25.1	26.2
Chicken	13.9	13.9	14.6	17.2	18.4	19.7	20.5
<b>Fish (kg)</b>	7.4	7.3	8.2	6.9	7.4	7.2	7.6
<b>Eggs (kg)</b>	14.0	13.3	13.0	12.8	12.2	12.0	11.8
<b>Dairy products</b>							
Fluid milks (L)	94.6	96.9	95.8	99.7	98.4	97.3	97.3
Standard milk	54.8	50.9	45.4	38.0	34.0	31.9	30.2
Partly skimmed milk	36.1	42.0	46.8	58.2	60.6	61.0	62.8
Skim milk	3.6	3.9	3.6	3.5	3.8	4.3	4.8
Cheese (kg)	5.9	7.0	7.0	8.6	8.4	9.1	9.8
Cheddar	2.1	2.1	1.6	2.1	2.2	2.5	2.7
Processed	2.4	2.6	2.7	3.0	2.8	2.8	2.7
Variety	1.4	2.3	2.7	3.5	3.4	3.8	4.4
Skim milk powder <sup>d</sup> (kg)	2.2	2.6	2.8	2.5	2.5	1.8	1.8
Canned milk (L)	5.5	5.0	4.3	4.3	2.7	3.6	2.8
Yogurt (L)	0.6	0.6	0.9	1.7	2.1	2.4	2.8
Ice cream (L)	12.7	12.4	12.2	12.3	12.0	12.2	12.4
<b>Fats and oils (kg)</b>	21.6	22.0	22.5	22.7	22.8	23.5	23.5
Animal	6.6	5.9	5.1	4.3	4.3	4.0	4.0
Vegetable	15.0	16.1	17.4	18.4	18.5	19.5	19.5
<b>Cereals (kg)</b>	68.4	68.1	70.9	69.8	69.0	72.4	72.5
Wheat flour	58.1	58.1	61.4	57.5	56.8	60.5	59.6
Rice	2.8	2.3	2.6	3.8	3.9	4.0	4.5
<b>Sugar and syrups (kg)</b>	45.8	42.3	43.1	39.1	41.2	42.4	42.6
Sugar	44.8	41.3	42.1	38.0	41.0	42.2	42.6
<b>Pulses and nuts (kg)</b>	4.0	4.8	4.3	4.1	—	6.2	7.6
<b>Fruits and vegetables<sup>c</sup> (kg)</b>	234.1	243.0	248.9	262.0	264.0	248.4	271.0

Table 1 (continued)

Food	1972	1974	1976	1982	1984	1985	1986
<b>Fruit</b>	108.7	118.1	122.7	124.9	134.2	118.2	122.2
Fresh	54.3	60.0	64.6	60.0	62.9	60.2	62.7
Canned	16.9	17.9	10.9	17.6	20.1	19.6	19.3
Frozen	1.5	1.3	1.2	0.8	1.0	1.2	0.9
Juice	25.5	29.3	35.0	46.1	49.6	36.6	38.8
Other	10.5	9.7	11.0	0.4	0.6	0.6	0.5
<b>Vegetables</b>	125.4	124.9	126.2	137.1	129.8	130.3	148.8
Fresh	109.1	107.5	114.2	120.0	115.3	121.6	138.1
Canned	12.1	12.6	8.4	10.8	8.3	2.7	4.0
Frozen	4.2	4.8	3.7	6.3	6.2	6.0	6.8
<b>Beverages</b>							
<b>Non-alcoholic</b>							
Tea <sup>f</sup> (kg)	1.1	1.3	1.1	0.9	0.9	0.5	—
Coffee <sup>g</sup> (kg)	4.1	4.3	4.4	4.4	4.4	4.5	4.4
Cocoa <sup>g</sup> (kg)	1.7	1.5	1.4	1.3	0.9	1.0	—
Soft drinks (L)	—	62.2	63.8	67.9	73.8	77.8	83.9
<b>Alcoholic (L)</b>	93.5	99.5	99.7	100.4	97.7	94.2	96.5
Ale, beer, stout and porter	81.7	85.8	85.0	83.4	82.0	78.0	80.1
Distilled spirits	6.5	7.8	8.1	7.6	6.7	6.6	6.4
Wines	5.3	5.9	6.6	9.4	8.9	9.7	10.1

<sup>a</sup> Retail weight

<sup>b</sup> Cold dressed carcass weight

<sup>c</sup> Eviscerated weight

<sup>d</sup> Data include both regular and instant skim milk powder

<sup>e</sup> Fresh equivalent

<sup>f</sup> Tea-leaf equivalent

<sup>g</sup> Green-bean equivalent

— no suitable data found

Source: Statistics Canada, *Apparent Per Capita Food Consumption in Canada*, Catalogue Nos. 32-229, 32-230, annual

Table 2:

Trends in quantities of food purchased, per capita per year<sup>a</sup>, 1974 and 1986

Food	1974	1986
<b>Meat, poultry, fish and eggs</b>		
Red meat (kg)	53.0	50.0
Beef	33.9	31.1
Pork	16.0	15.1
Other	3.1	3.8
Poultry (kg)	14.4	18.3
Chicken	9.8	15.7
Fish (kg)	4.1	6.6
Eggs (kg)	12.5	11.2
<b>Dairy products</b>		
Cheese (kg)	5.8	7.4
Cheddar	1.5	2.3
Processed	1.7	2.6
Variety	2.6	2.6
Fluid milks (L)	86.2	102.6
Standard milk	45.5	29.4
Partly skimmed milk	37.1	66.7
Skim milk	3.6	6.5
Skim milk powder (kg)	0.8	0.2
Yogurt (L)	1.0	3.4
Canned milk (L)	3.2	1.2
Ice cream (L)	6.1	8.0
<b>Fats and oils (kg)</b>	12.7	10.9
Animal	4.9	3.4
Vegetable	7.8	7.5
<b>Bakery products (kg)</b>	52.9	42.4
<b>Cereal products (kg)</b>	18.8	23.0
<b>Sugar and syrups (kg)</b>	13.1	11.0
Sugar	11.1	6.9
<b>Pulses and nuts (kg)</b>	4.1	3.5

Table 2 (continued)

Food	1974	1986
<b>Fruit (kg)</b>		
Fresh	42.5	53.8
Canned	5.1	4.3
Frozen	0.3	0.1
Juice	15.7	38.1
Other	0.9	1.0
<b>Vegetables (kg)</b>		
Fresh	64.9	73.0
Canned	11.5	13.8
Frozen	3.3	4.3
<b>Non-alcoholic beverages</b>		
Tea (kg)	0.9	0.9
Coffee (kg)	1.9	2.0
Other (incl. soft drinks) (L)	39.3	48.2

<sup>a</sup> Retail weight

Sources: Statistics Canada, *Urban Family Food Expenditures, 1974*, Catalogue No. 62-542, Ottawa, June 1977; and Statistics Canada, *Family Food Expenditure in Canada, 1986*, Catalogue No. 62-554, January 1989.

Table 3:

Mean daily and annual Canadian intake of food, by major food group<sup>a</sup>

Food	g/day	kg/year
Dairy products	439	160.2
Meat, fish, poultry and eggs	157	57.3
Cereal products (including breakfast cereals)	259	94.5
Fruit and fruit products	237	86.5
Vegetables (not including potatoes)	110	40.2
Potatoes	117	42.7
Fats and oils	23	8.4
Nuts and legumes	12	4.4
Foods primarily sugar	50	18.3
Soft drinks	125	45.6
Mixed dishes and soups	115	42.0

<sup>a</sup> Quantities were derived by weighing quantities reported as being consumed by the various age and sex groups in the sample by their corresponding numbers in the total population surveyed by Nutrition Canada.

Source: Health and Welfare Canada, *Nutrition Canada Survey*, Ottawa, 1972.



Table 4:

Nutrients available for consumption from the Canadian food supply, per capita per day, 1972-86

Nutrient (unit)	1972	1974	1976	1982	1984	1985	1986 <sup>P</sup>
Food energy (kcal)	3 230	3 190	3 235	2 925	2 925	3 000	3 020
(kJ)	13 510	13 350	13 540	12 240	12 240	12 550	12 640
Carbohydrate (g)	385	370	376	355	356	365	371
Fibre (g)	17.2	18.0	17.0	17.5	16.3	16.7	17.1
Protein (g)	89	90	92	92	90	92	91
Fat (g)	153	154	156	130	131	134	134
Saturated fat (g)	55.5	54.9	54.5	42.3	41.7	42.4	42.4
Monounsaturated fat (g)	69.4	70.6	72.0	63.0	63.0	64.4	64.7
Polyunsaturated fat (g)	15.1	15.7	16.4	15.0	15.8	16.7	17.0
Linoleic acid (g)	13.4	14.0	14.5	13.0	13.7	14.3	14.6
Cholesterol (mg)	457	443	440	427	417	420	408
Calcium (mg)	829	874	864	886	863	862	861
Phosphorus (mg)	1 391	1 424	1 423	1 455	1 413	1 433	1 419
Iron (mg)	16.6	16.3	16.3	14.5	13.9	14.5	14.4
Sodium (mg)	1 232	1 256	1 244	1 215	1 155	1 109	1 113
Potassium (mg)	3 356	3 430	3 437	3 427	3 311	3 353	3 474
Vitamin A (R.E.)	1 195	1 261	1 304	1 360	1 343	1 372	1 440
Ascorbic acid (mg)	99	102	112	118	119	117	127
Thiamin (mg)	2.27	2.28	2.29	2.37	2.32	2.40	2.43
Riboflavin (mg)	2.13	2.17	2.20	2.09	2.06	2.09	2.09
Niacin (N.E.)	43.2	43.5	44.7	39.6	39.1	40.4	40.6
Folacin (mcg)	223	233	229	231	227	231	240

P preliminary

Sources: Agriculture Canada Nutrient Assessment Program (AGNAP) using Statistics Canada, *Apparent Per Capita Food Consumption Survey* data; and Health and Welfare Canada, *Canadian Nutrient File* 1988 data.

Table 5a:

## Percent contribution of major food groups to nutrient availability, 1972 and 1986

Food	Energy	Carbohydrate	Protein	Fat	Calcium	Phosphorus	Iron	Sodium
1972								
Cereals	21.1	37.2	21.4	1.4	4.3	14.9	36.7	8.1
Sugars and syrups	16.1	34.9	0.0	0.0	0.9	0.2	4.2	0.9
Pulses and nuts	2.4	1.6	4.0	3.2	2.1	4.5	4.8	3.0
Fats and oils	17.3	0.0	0.3	41.3	0.9	0.5	0.2	20.8
Fruits <sup>b</sup>	4.1	8.7	1.7	0.4	3.6	2.4	4.7	9.0
Vegetables <sup>c</sup>	5.0	9.5	5.7	0.2	4.5	8.4	11.7	8.2
Meat, poultry and fish	21.1	0.0	38.9	38.7	2.8	24.9	27.4	14.4
Eggs	1.7	0.1	4.7	2.5	2.3	4.4	4.4	3.8
Dairy products	10.3	6.8	20.7	11.4	75.2	36.4	2.0	31.6
Beverages	0.4	0.9	0.9	0.2	1.5	3.2	3.8	0.2
1986								
Cereals	23.5	40.7	21.1	1.7	4.2	15.4	45.0	10.0
Sugars and syrups	14.9	31.3	0.0	0.0	0.0	0.0	0.9	0.1
Pulses and nuts	2.8	1.2	3.9	4.9	1.6	3.7	3.5	0.2
Fats and oils	17.3	0.0	0.3	44.0	0.8	0.4	0.2	22.2
Fruits <sup>b</sup>	3.7	7.4	1.7	0.5	3.3	2.6	5.8	5.0
Vegetables <sup>c</sup>	5.9	11.0	6.2	0.3	5.5	8.1	13.4	6.8
Meat, poultry and fish	17.6	0.0	39.2	31.3	20.0	23.5	20.1	11.0
Eggs	1.5	0.1	3.8	2.4	1.9	3.6	4.3	3.6
Dairy products	12.1	7.3	22.7	14.7	79.3	38.7	2.7	40.5
Beverages	0.2	0.5	0.1	0.3	0.9	1.4	2.0	0.3

<sup>a</sup> Contributions may not total 100% due to rounding<sup>b</sup> Includes tomatoes<sup>c</sup> Includes mushrooms and potatoesSources: Agriculture Canada Nutrient Assessment Program (AGNAP) using Statistics Canada, *Apparent Per Capita Food Consumption Survey* data; and Health and Welfare Canada, *Canadian Nutrient File* 1988 data.

Table 5b:

## Percent contribution of major food groups to nutrient availability, 1972 and 1986

Food	Potassium	Vitamin A	Vitamin C	Thiamin	Riboflavin	Niacin	Folacin
1972							
Cereals	6.5	0.6	0.0	52.7	28.1	28.6	21.5
Sugars and syrups	0.2	0.0	0.0	0.0	1.2	0.0	0.0
Pulses and nuts	4.0	0.1	0.4	4.0	1.5	4.4	8.1
Fats and oils	0.3	20.9	0.0	0.1	0.5	0.2	0.3
Fruits <sup>b</sup>	12.3	6.2	43.2	4.4	4.0	2.7	11.6
Vegetables <sup>c</sup>	32.9	30.4	49.1	9.9	5.2	9.6	29.0
Meat, poultry and fish	16.1	15.1	1.0	20.7	16.9	37.7	9.0
Eggs	1.3	4.5	0.0	1.3	4.8	2.6	10.0
Dairy products	20.6	22.0	5.9	7.3	36.3	10.7	10.2
Beverages	5.4	0.0	0.0	0.2	1.2	3.2	0.0
1986							
Cereals	6.7	0.5	0.0	51.9	29.4	31.8	21.5
Sugars and syrups	0.1	0.0	0.0	0.0	1.1	0.0	0.0
Pulses and nuts	2.8	0.4	0.3	3.1	1.4	4.7	6.1
Fats and oils	0.3	19.0	0.0	0.1	0.5	0.2	0.2
Fruits <sup>b</sup>	14.1	5.7	49.8	5.3	4.6	3.0	14.3
Vegetables <sup>c</sup>	31.2	38.0	44.4	9.1	5.8	9.9	31.6
Meat, poultry and fish	15.2	11.1	1.0	20.9	13.4	29.6	6.0
Eggs	1.1	3.1	0.0	1.0	4.1	2.3	7.8
Dairy products	19.8	21.7	3.8	6.7	37.8	12.6	10.1
Beverages	4.0	0.0	0.0	0.0	0.5	3.1	0.0

a Contributions may not total 100% due to rounding

b Includes tomatoes

c Includes mushrooms and potatoes

Sources: Agriculture Canada Nutrient Assessment Program (AGNAP) using Statistics Canada, *Apparent Per Capita Food Consumption Survey* data; and Health and Welfare Canada, *Canadian Nutrient File* 1988 data.

Table 6(a): Nutrient distribution in food purchased by the average Canadian, 1986

Food Group	Food energy (kcal/k)	Fibre (g)	Protein (g)	Fat (g)	SFA (g)	MUFA (g)	PUFA (g)	Linoleic (g)	Cholesterol (mg)
Beef	136.13	0.00	14.07	8.39	3.33	3.74	0.31	0.23	38.67
Pork	569.57	0.00	6.54	4.70	1.63	2.17	0.55	0.44	17.72
Other meat	298.24	0.00	5.44	7.94	2.94	3.70	0.77	0.68	29.91
Poultry	412.12	0.00	10.22	3.81	1.06	1.42	0.84	0.71	32.07
Fish	77.94	0.00	3.64	0.99	0.23	0.20	0.09	0.09	11.57
Fluid milk	326.10	0.00	12.28	8.18	5.09	2.36	0.30	0.18	32.82
Other dairy products	805.80	0.00	8.95	12.94	8.12	3.72	0.32	0.25	44.48
Meat alternates	189.90	1.13	7.09	8.87	1.88	4.00	2.07	1.94	179.08
Bakery products	794.54	4.03	12.93	10.28	2.62	4.97	2.15	2.15	25.09
Cereal products	505.80	1.77	6.89	0.93	0.00	0.02	0.02	0.02	0.00
Fresh fruit	2024.26	2.73	0.93	0.54	0.10	0.09	0.11	0.09	0.00
Processed fruit	82.32	0.42	0.48	0.12	0.01	0.01	0.02	0.02	0.00
Fresh vegetables	63.39	3.43	2.82	0.38	0.06	0.03	0.16	0.11	0.00
Processed vegetables	265.22	1.48	1.06	0.71	0.29	0.25	0.10	0.09	0.00
Miscellaneous foods	94.64	0.03	0.80	0.59	0.06	0.16	0.12	0.11	0.00
Sugars	131.71	0.03	1.48	3.34	0.94	1.76	0.43	0.41	0.76
Coffee and tea	148.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fats and oils	256.74	0.00	0.33	36.84	10.01	17.67	7.78	6.35	26.79
Prepared foods	1074.20	0.00	2.64	3.31	0.92	0.88	1.27	1.25	2.69
Total	9.13	15.05	98.59	112.86	39.29	47.15	17.41	15.12	441.65
	38.20								
	333.26								
	1394.36								
	87.92								
	367.86								
	2652.78								
	11099.23								

Sources: Agriculture Canada Nutrient Assessment Program (AGNAP) using Statistics Canada, *Family Food Expenditure Survey, 1986 data*; and Health and Welfare, *Canadian Nutrient File, 1988 data*.

Table 6(b): Nutrient distribution in food purchased by the average Canadian, 1986

Food Group	Carbohydrate (g)	Calcium (mg)	Iron (mg)	Phosphorus (mg)	Potassium (mg)	Sodium (mg)	Vit. A (RE)	Vit. C (mg)
Beef	0.14	6.34	1.24	94.93	175.93	92.66	0.00	1.46
Pork	0.21	5.88	0.29	67.34	102.03	219.29	0.24	2.57
Other meat	0.89	3.41	0.65	46.56	80.07	296.14	173.25	1.04
Poultry	0.00	5.83	0.48	69.38	86.78	29.96	10.34	0.00
Fish	0.16	11.20	0.22	43.10	57.43	67.27	6.82	0.14
Fluid milk	17.61	447.69	0.18	351.18	570.43	183.92	184.25	3.50
Other dairy products	9.75	261.53	0.20	221.73	152.66	291.11	127.62	1.06
Meat alternates	4.04	29.89	1.11	109.96	135.49	74.62	51.71	0.13
Bakery products	84.71	124.88	4.53	197.63	198.12	815.60	13.97	0.04
Cereal products	55.74	35.66	2.92	123.56	110.93	173.33	0.04	0.00
Fresh fruit	20.67	19.68	0.27	18.74	279.83	1.13	28.60	27.21
Processed fruit	15.86	11.00	0.35	14.27	170.44	3.77	13.25	33.86
Fresh vegetables	21.50	46.12	1.09	71.08	510.01	31.53	459.54	27.10
Processed vegetables	5.87	9.44	0.46	22.91	123.15	121.77	28.91	7.83
Miscellaneous foods	7.68	51.97	1.41	23.26	80.56	739.81	18.02	2.37
Sugars	57.67	37.62	0.59	47.53	89.93	21.66	2.77	2.34
Coffee and tea	2.47	12.58	0.39	26.92	229.70	5.06	0.00	0.00
Fats and oils	1.50	8.17	0.03	8.12	11.82	294.13	255.28	0.02
Prepared foods	12.38	29.19	0.79	45.54	155.44	352.52	67.94	3.27
<b>Total</b>	<b>318.85</b>	<b>1158.08</b>	<b>17.20</b>	<b>1603.74</b>	<b>3320.75</b>	<b>3815.28</b>	<b>1442.55</b>	<b>113.94</b>

Sources: Agriculture Canada Nutrient Assessment Program (AGNAP) using Statistics Canada, *Family Food Expenditure Survey, 1986 data*; and Health and Welfare, *Canadian Nutrient File, 1988 data*.

Table 6(c): Nutrient distribution in food purchased by the average Canadian, 1986

Food Group	Thiamin (mg)	Riboflavin (mg)	Niacin (NE)	Folacin (mcg)
Beef	0.03	0.11	5.13	4.57
Pork	0.19	0.07	2.80	1.21
Other meat	0.09	0.12	2.36	3.82
Poultry	0.02	0.06	5.01	2.09
Fish	0.00	0.01	1.47	2.74
Fluid milk	0.14	0.59	3.19	18.77
Other dairy products	0.02	0.22	2.06	6.42
Meat alternates	0.05	0.10	2.79	27.22
Bakery products	0.56	0.38	7.59	46.50
Cereal products	0.44	0.11	3.82	19.44
Fresh fruit	0.05	0.05	0.60	19.25
Processed fruit	0.04	0.01	0.33	14.74
Fresh vegetables	0.13	0.08	2.24	47.82
Processed vegetables	0.03	0.02	0.71	15.01
Miscellaneous foods	0.00	0.01	0.31	1.17
Sugars	0.01	0.07	0.58	4.55
Coffee and tea	0.00	0.01	2.15	0.00
Fats and oils	0.00	0.00	0.08	1.10
Prepared foods	0.07	0.08	1.40	7.09
<b>Total</b>	<b>1.87</b>	<b>2.10</b>	<b>44.61</b>	<b>243.51</b>

Sources: Agriculture Canada Nutrient Assessment Program (AGNAP) using Statistics Canada, *Family Food Expenditure Survey, 1986 data*; and Health and Welfare, *Canadian Nutrient File, 1988 data*.



Table 7(a): Percent distribution of nutrients by major food groups in food purchased by the Average Canadian, 1986

Food Group	Food energy	Fibre	Protein	Fat	SFA	MUFA	PUFA	Linoleic	Cholesterol
Beef	5.13	0.00	14.27	7.43	8.48	7.93	1.78	1.52	8.76
Pork	2.69	0.00	6.63	4.16	4.15	4.60	3.16	2.91	4.01
Other meat	3.71	0.00	5.52	7.04	7.48	7.85	4.42	4.50	6.77
Poultry	2.94	0.00	10.37	3.38	2.70	3.01	4.82	4.70	7.26
Fish	0.95	0.00	3.69	0.88	0.59	0.42	0.52	0.60	2.62
Fluid milk	7.26	0.00	12.46	7.25	12.95	5.01	1.72	1.19	7.43
Other dairy products	7.16	0.00	9.08	11.47	20.67	7.89	1.84	1.65	10.07
Meat alternates	4.56	7.51	7.19	7.86	4.78	8.48	11.89	12.83	40.55
Bakery products	18.24	26.78	13.11	9.11	6.67	10.54	12.35	14.22	5.68
Cereal products	9.88	11.76	6.99	0.82	0.00	0.04	0.11	0.13	0.00
Fresh fruit	3.10	18.14	0.94	0.48	0.25	0.19	0.63	0.60	0.00
Processed fruit	2.39	2.79	0.49	0.11	0.03	0.02	0.11	0.13	0.00
Fresh vegetables	3.57	22.79	2.86	0.34	0.15	0.06	0.92	0.73	0.00
Processed vegetables	1.19	9.83	1.08	0.63	0.74	0.53	0.57	0.60	0.00
Miscellaneous foods	1.34	0.20	0.81	0.52	0.15	0.34	0.69	0.73	0.00
Sugars	9.68	0.20	1.50	2.96	2.39	3.73	2.47	2.71	0.17
Coffee and tea	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fats and oils	12.56	0.00	0.33	32.64	25.48	37.48	44.69	42.00	6.07
Prepared foods	3.31	0.00	2.68	2.93	2.34	1.87	7.29	8.27	0.61
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Sources: Agriculture Canada Nutrient Assessment Program (AGNAP) using Statistics Canada, *Family Food Expenditure Survey, 1986 data*; and Health and Welfare, *Canadian Nutrient File, 1988 data*.

Table 7(b): Percent distribution of nutrients by major food groups in food purchased by the average Canadian, 1986

Food Group	Carbohydrate	Calcium	Iron	Phosphorus	Potassium	Sodium	Vit. A	Vit. C
Beef	0.04	0.55	7.21	5.92	5.30	2.43	0.00	1.28
Pork	0.07	0.51	1.69	4.20	3.07	5.75	0.02	2.26
Other meat	0.28	0.29	3.78	2.90	2.41	7.76	12.01	0.91
Poultry	0.00	0.50	2.79	4.33	2.61	0.79	0.72	0.00
Fish	0.05	0.97	1.28	2.69	1.73	1.76	0.47	0.12
Fluid milk	5.52	38.66	1.05	21.90	17.18	4.82	12.77	3.07
Other dairy products	3.06	22.58	1.16	13.83	4.60	7.63	8.85	0.93
Meat alternates	1.27	2.58	6.45	6.86	4.08	1.96	3.58	0.11
Bakery products	26.57	10.78	26.34	12.32	5.97	21.38	0.97	0.04
Cereal products	17.48	3.08	16.98	7.70	3.34	4.54	0.00	0.00
Fresh fruit	6.48	1.70	1.57	1.17	8.43	0.03	1.98	23.88
Processed fruit	4.97	0.95	2.03	0.89	5.13	0.10	0.92	29.72
Fresh vegetables	6.74	3.98	6.34	4.43	15.36	0.83	31.86	23.78
Processed vegetables	1.84	0.82	2.67	1.43	3.71	3.19	2.00	6.87
Miscellaneous foods	2.41	4.49	8.20	1.45	2.43	19.39	1.25	2.08
Sugars	18.09	3.25	3.43	2.96	2.71	0.57	0.19	2.05
Coffee and tea	0.77	1.09	2.27	1.68	6.92	0.13	0.00	0.00
Fats and oils	0.47	0.71	0.17	0.51	0.36	7.71	17.70	0.02
Prepared foods	3.88	2.52	4.59	2.84	4.68	9.24	4.71	2.87
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

Sources: Agriculture Canada Nutrient Assessment Program (ACNAP) using Statistics Canada, *Family Food Expenditure Survey, 1986 data*; and Health and Welfare, *Canadian Nutrient File, 1988 data*.

Table 7(c): Percent distribution of nutrients by major food groups in food purchased by the average Canadian, 1986

Food Group	Thiamin	Riboflavin	Niacin	Folacin
Beef	1.60	5.24	11.50	1.88
Pork	10.16	3.33	6.28	0.50
Other meat	4.81	5.71	5.29	1.57
Poultry	1.07	2.86	11.23	0.86
Fish	0.00	0.48	3.30	1.13
Fluid milk	7.49	28.10	7.15	7.71
Other dairy products	1.07	10.48	4.62	2.64
Meat alternates	2.67	4.76	6.23	11.18
Bakery products	29.95	18.10	17.01	19.10
Cereal products	23.53	5.24	8.56	7.96
Fresh fruit	2.67	2.38	1.34	7.91
Processed fruit	2.14	0.48	0.74	6.05
Fresh vegetables	6.95	3.81	5.02	19.64
Processed vegetables	1.60	0.95	1.59	6.16
Miscellaneous foods	0.00	0.48	0.69	0.48
Sugars	0.53	3.33	1.30	1.87
Coffee and tea	0.00	0.48	4.82	0.00
Fats and oils	0.00	0.00	0.18	0.45
Prepared foods	3.74	3.81	3.14	2.91
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

Sources: Agriculture Canada Nutrient Assessment Program (AGNAP) using Statistics Canada, *Family Food Expenditure Survey, 1986 data*; and Health and Welfare, *Canadian Nutrient File, 1988 data*.

Table 8:

Comparison of nutrient intakes, per capita per day, as determined from food availability, food purchase and Nutrition Canada Survey data

Nutrient	Food availability data <sup>a</sup> (1972)	Food purchase data <sup>b</sup> (1974)	Nutrition Canada Survey data <sup>c</sup> (1972)
Food energy (kcal)	3 230	2 523	2 353
(kJ)	13 519	10 556	9 845
Carbohydrate (g)	385 (47.0%) <sup>d</sup>	279 (44.0%) <sup>d</sup>	268 (46.0%)
Protein (g)	89 (11.0%)	81 (12.5%)	83 (14.0%)
Fat (g)	153 (42.0%)	123 (43.5%)	103 (40.0%)
Calcium (mg)	829	899	930
Iron (mg)	16.6	15.0	14.0
Vitamin A (R.E.)	1 195	1 182	1 213
Ascorbic acid (mg)	99	94	98
Thiamin (mg)	2.3	1.5	1.2
Riboflavin (mg)	2.1	2.0	2.0
Niacin (N.E.)	43.2	34.0	32.0
Folacin (mcg)	223	194	166

<sup>a</sup> Based on *Apparent Per Capita Food Consumption in Canada* data for 1972. Nutrient consumption data derived using AGNAP.

<sup>b</sup> Based on *Family Food Expenditure Survey* data for 1974. Nutrient consumption data derived using AGNAP and adjusted for dining out.

<sup>c</sup> Health and Welfare Canada, *Nutrition Canada Survey*, Ottawa, 1972.

<sup>d</sup> Figures in parentheses give the percentage contribution to total food energy intake.

Table 9:

## Sources of total fat in the average Canadian diet, 1986

Food Group	%	Major foods	%
All	100.0		
Beef	7.4	hamburger wieners	3.9 1.5
Pork	4.1	bacon	1.1
Other meat	7.0	sausage	4.6
Poultry	3.3	chicken	3.0
Fish	0.8	—	
Dairy products	18.6	low-fat milk cheese ice cream	4.0 6.8 2.5
Meat alternates	7.8	eggs peanut butter	3.2 2.5
Bakery products	9.1	bread	2.5
Cereal products	0.8	—	
Fresh fruit	0.4	—	
Processed fruit	0.1	—	
Fresh vegetables	0.3	—	
Processed vegetables	0.6	french fries	0.5
Miscellaneous foods	0.5	—	
Sugar and sweets	2.9	marzipan	1.7
Coffee and tea	0.0	—	
Fats and oils	32.6	butter oil margarine	7.9 7.8 11.9
Prepared foods	2.9	potato chips	1.7

— no suitable data found

Source: AGNAP using Statistics Canada, *Family Food Expenditure Survey*, 1986 data.

Table 10:

## Sources of sodium in the average Canadian diet, 1986

Food Group	%	Major foods	%
All	100.0		
Beef	2.4	wieners	1.5
Pork	5.7	sliced ham	1.8
Other meat	7.7	sausage	5.3
Poultry	0.7	chicken	0.7
Fish	1.7	smoked fish	0.7
Dairy products	12.4	low-fat milk	3.1
		cheese	5.9
Meat alternates	1.9	eggs	1.1
Bakery products	21.3	bread	11.7
Cereal products	4.5	breakfast cereal	1.9
Fresh fruit	0.0	—	—
Processed fruit	0.0	—	—
Fresh vegetables	0.8	—	—
Processed vegetables	3.1	tomato juice	0.7
Miscellaneous foods	19.3	seasonings	12.4
Sugar and sweets	0.5	—	—
Coffee and tea	0.1	—	—
Fats and oils	7.7	butter	2.1
		margarine	4.4
Prepared foods	9.2	soup	6.5

— no suitable data found

Source: AGNAP using Statistics Canada, *Family Food Expenditure Survey, 1986* data.



Table 11:

## Sources of cholesterol in the average Canadian diet, 1986

Food Group	%	Major foods	%
All	100.0		
Beef	8.7	hamburger	4.1
Pork	4.0	pork loin	0.9
Other meat	6.7	liver	1.3
		sausage	2.4
Poultry	7.2	chicken	6.4
Fish	2.6	seafish	0.4
		canned shrimp	0.3
Dairy products	17.4	low-fat milk	4.0
		ice cream	2.8
		cheese	5.3
Meat alternates	40.5	eggs	40.5
Bakery products	5.6	muffins	2.8
Cereal products	0.0	—	—
Fresh fruit	0.0	—	—
Processed fruit	0.0	—	—
Fresh vegetables	0.0	—	—
Processed vegetables	0.0	—	—
Miscellaneous foods	0.0	—	—
Sugar and sweets	0.1	—	—
Coffee and tea	0.0	—	—
Fats and oils	6.0	butter	5.5
Prepared foods	0.6	—	—

— no suitable data found

Source: AGNAP using Statistics Canada, *Family Food Expenditure Survey, 1986* data.

Table 12:

## Sources of carbohydrates in the average Canadian diet, 1986

Food Group	%	Major foods	%
All	100.0		
Beef	0.0	—	—
Pork	0.0	—	—
Other meat	0.2	—	—
Poultry	0.0	—	—
Fish	0.0	—	—
Dairy products	8.5	low-fat milk ice cream	3.6 2.1
Meat alternates	1.2	—	—
Bakery products	26.5	bread	13.9
Cereal products	17.4	flour	5.1
Fresh fruit	6.4	bananas	1.9
Processed fruit	4.9	canned apple juice	1.2
Fresh vegetables	6.7	potatoes	4.2
Processed vegetables	1.8	frozen french fries	0.7
Miscellaneous foods	2.4	seasonings	0.5
Sugar and sweets	18.0	sugar soft drinks	7.5 4.0
Coffee and tea	0.7	—	—
Fats and oils	0.4	—	—
Prepared foods	3.8	potato chips	0.8

— no suitable data found

Source: AGNAP using Statistics Canada, *Family Food Expenditure Survey*, 1986 data.

Table 13:

## Sources of fibre in the average Canadian diet, 1986

Food Group	%	Major foods	%
All	100.0		
Beef	0.0	—	—
Pork	0.0	—	—
Other meat	0.0	—	—
Poultry	0.0	—	—
Fish	0.0	—	—
Dairy Products	0.0	—	—
Meat alternates	7.5	dried beans peanut butter	2.0 2.7
Bakery products	26.7	bread	15.8
Cereal products	11.7	flour	4.6
Fresh fruit	18.1	bananas	5.9
Processed fruit	2.8	dried fruit	1.6
Fresh vegetables	22.7	potatoes	4.4
Processed vegetables	9.8	frozen vegetables	3.8
Miscellaneous foods	0.2	—	—
Sugar and sweets	0.2	—	—
Coffee and tea	0.0	—	—
Fats and oils	0.0	—	—
Prepared foods	0.0	—	—

— no suitable data found

Source: AGNAP using Statistics Canada, *Family Food Expenditure Survey*, 1986 data.

# Appendix III

## Nutrient Sources in the Canadian Diet

### Introduction

In order to assess the impact of food consumption patterns on nutrient intakes of Canadians, it is necessary to identify the major dietary sources of nutrients in Canadian diets. Such information is also required in order to aim for changes in food consumption in line with the updated Nutrition Recommendations.

### Method

An estimate of the major sources of nine nutrients was made from the portion sizes and frequency of mention of the foods consumed as reported during the Nutrition Canada Survey of 1971-72. To achieve this, foods were grouped into 115 food composites, with the most frequently mentioned food in each composite chosen as representing the nutrient content. For example, "milk, whole" represented all whole milks such as goat, human and whole cow's milk beverages. As this method was designed for compiling data in a previous study, the representative single food may not provide the optimum nutrient content of the food group. Most groups, however, did conform to food groups selected with nutrient composition in mind and used in studies in the United States. An example of a typical food group is:

Celery:	Food included	Number of mentions
	celery, raw	1 241
	celery, boiled	560
	asparagus, boiled spears	71
	bamboo shoots, raw	11
	asparagus, frozen, boiled spears	8
	asparagus, frozen, boiled tips	7
	artichoke, french, boiled	3
	asparagus, raw	2
	artichoke, french, raw	2

Nutrient values of the representative foods were calculated using the 1988 edition of the Canadian Nutrient File and the average portion sizes consumed in the Nutrition Canada Survey. Foods were ranked in descending order of source of nutrients. Some foods were subdivided to illustrate nutrient sources for example, "potatoes, boiled, fried and chips" and the generic food "potatoes" would rank quite differently.

### Results

Table 1 illustrates the 115 food composites with the representative food, the number of mentions, that is, eating occasions, for each composite and the average daily intake in grams noted. The 50 food composites most frequently mentioned by the persons interviewed in the Nutrition Canada Survey are shown in Table 2 in descending order of frequency of use (frequency). Table 3 shows in descending order the number and percentage of persons who ate foods in the first 50 food composites (popularity). For example, 52.9% (6 772) of the subjects in the Nutrition Canada Survey drank whole milk, while 20.5% (2 618) drank 2% milk. Tables 4 to 13 illustrate the sources of energy, total fat, total saturated fatty acids, total monounsaturated fatty acids, total polyunsaturated fatty acids, cholesterol, calcium, iron, sodium and dietary fibre in descending order of energy or nutrient.

### Discussion

The tables provide an historical base for assessing nutrient sources in the Canadian diet and for targeting changes in food consumption in line with updated dietary advice. If changes in food consumption patterns have occurred since these data were collected, thesequence of listing would be altered. For example, whole milk and 2% milk have now reversed positions, and butter has moved down the list as margarine moved up.

Updates in the nutrient database may also affect the sequence of listing. The veal, lamb and fish groups have not been updated; in addition, fat and cholesterol values may be too high in light of more recent pork and beef data.

By applying food disappearance trends to these data, some appreciation of present consumption may be surmised. What becomes most apparent is that the portion size is just as important as the nutrient density as illustrated by the dominance of "pasta, mixed dishes" (approximately two cups of macaroni and cheese).

### Summary

Foods were listed in descending order of nutrient contribution to the diet of all subjects in the Nutrition Canada Survey who consumed each food composite. Portion size was a major factor, as was nutrient density, in the listed ranking of identified energy and nutrient sources in Canadian diets. More recent data would change the sequence in the listings.

Table 1:

Food composites, including number of times composites were mentioned and average weight of composite consumed per day, from Nutrition Canada Survey, 1971-72

Composite Name	Representative food	Number of mentions*	Average intake in grams
<b>Dairy</b>			
Milk, whole	whole	26 558	410.18
Milk, 2%	2%	10 094	442.20
Milk, skim	skim	5 092	376.52
Milk, evaporated	evaporated, whole	12 855	73.13
Cream	half-and-half	4 281	45.77
Ice Cream	10% B.F.	4 185	88.67
Yogurt	plain	137	143.98
Cheese, natural	cheddar	2 472	47.56
Cheese, cottage	creamed, 4% B.F.	764	78.23
Cheese, processed	pasteurized, cheddar	2 776	32.85
<b>Fats and oils</b>			
Butter	—	23 326	22.59
Margarine	—	12 724	20.71
Cooking fat, animal	lard	1 738	13.99
Vegetable oil	mayonnaise	7 594	13.22
<b>Meat and eggs</b>			
Beef, steak	round, lean and fat, broiled	1 943	128.66
Beef, roast	cross-rib, lean and fat, roasted	4 615	90.06
Beef, ground	hamburger, regular	4 412	104.70
Pork, fresh	ham, lean and fat, roasted	5 484	82.38
Pork, cured	bacon	2 669	25.12
Pork, sausages	sausages	894	95.72
Wieners	cooked	1 458	49.92
Veal	loin, cutlets, broiled	245	86.89
Lamb	leg, lean and fat, roasted	148	115.54
Poultry	chicken, drumstick, fried	4 673	102.90
Eggs	fried	7 815	78.67
Organ meats	liver, beef, fried	656	76.63
Cold cuts (luncheon meats)	bologna	3 865	62.90



Table 1 (continued)

Composite Name	Representative food	Number of mentions*	Average intake in grams
<b>Fish and shellfish</b>			
Fish, fresh or frozen	cod, broiled	1 683	140.16
Fish, canned	tuna, drained, solid, in oil	1 033	61.44
Shellfish	shrimp, canned, drained	390	74.34
<b>Soups</b>			
Soup	beef bouillon and water	7 032	242.74
<b>Baked goods and cereals</b>			
Bread, white	white	32 697	90.15
Bread, whole-wheat	whole-wheat	4 823	86.32
Rolls and buns	hotdog/hamburger	3 813	66.82
Muffins	bran	390	79.53
Cake	white, without icing	6 046	94.05
Cookies	sandwich type	10 001	49.78
Danish and doughnuts	sweet rolls	1 667	77.67
Crackers	soda crackers	4 916	22.25
Pancakes	homemade	577	91.05
Cereals, wheat, cooked	Cream of Wheat	699	183.80
Cereals, wheat, dry	Muffets	1 690	31.19
Cereals, oatmeal, cooked	oatmeal, cooked	1 677	236.03
Cereals, oatmeal, dry	Cheerios	307	24.17
Cereals, corn, dry	Kellogg's Corn Flakes	1 936	28.43
Cereals, rice, dry	Rice Krispies	1 225	16.42
Rice, cooked	rice, long grain	2 393	138.47
Pie	apple	3 058	120.73
Pizza	homemade, sausage	284	168.39
Pasta, mixed dishes	macaroni and cheese, homemade	1 214	357.23
Pasta, plain	macaroni, unenriched, tender	1 902	153.06
<b>Vegetables</b>			
Corn	whole kernel, wet pack, drained	1 667	110.87
Popcorn	oil roasted, with salt	413	27.09
Potatoes, boiled	boiled without skin	12 743	162.94
Potatoes, fried	french fries	3 373	157.10
Potatoes, chips	—	2 399	29.48
Cabbage	boiled	2 092	78.20
Celery	raw	1 905	39.99

Table 1 (continued)

Composite Name	Representative Food	Number of mentions*	Average intake in grams
Peppers	green, raw	529	23.70
Green, leafy vegetables	iceberg lettuce	4 847	42.17
Cauliflower	boiled	220	75.32
Broccoli	boiled	199	135.89
Beans, green	canned, drained	1 817	66.51
Beans, mature	white, with pork and tomato sauce	1 168	170.64
Peas, green	canned, drained	3 107	55.91
Carrots	boiled	4 721	59.97
Onions	boiled	3 891	24.37
Rutabagas	boiled	2 173	49.83
Squash	summer, boiled	173	120.50
Tomatoes	raw, red	4 764	76.04
Tomato juice	canned	850	172.41
Tomato condiments	ketchup	3 208	26.26
Mushrooms	canned	453	52.88
Cucumbers	raw	1 018	49.45
Cucumber condiments	relish, sweet	2 665	33.14
Beets	boiled	623	49.65
<b>Fruit</b>			
Citrus fruit	oranges	3 636	182.71
Citrus juice	orange juice, frozen, diluted	3 973	212.33
Apples	raw	5 050	130.39
Fruit juice (non-citric)	apple juice	2 012	224.97
Bananas	raw	2 224	113.25
Grapes	European, adherent skin	355	99.04
Peaches	canned, heavy syrup	1 459	134.13
Pears	canned, light syrup	681	142.09
Plums and prunes	Damson, raw	685	118.16
Cherries	sweet, raw	374	86.27
Melons	watermelon	312	378.56
Rhubarb	cooked, with sugar	265	107.08
Berries	strawberries, raw	1 975	91.28
Pineapple	canned, light syrup	433	91.95
Dried fruit	raisins	888	18.87
Mixed fruit	canned	389	94.31
<b>Nuts and seeds</b>			
Peanuts	roasted, salted	577	41.50
Peanut butter	with salt	2 753	22.75
Nuts and seeds, other	walnuts	1 225	11.98

Table 1 (continued)

Composite Name	Representative Food	Number of mentions*	Average intake in grams
<b>Miscellaneous</b>			
Sugar	granulated	33 133	24.72
Syrup	table blend, mostly corn	2 096	52.51
Jam	jams and preserves	6 846	24.34
Honey	—	1 811	22.47
Puddings	butterscotch sauce	1 525	116.34
Gelatin desserts	plain	1 332	129.29
Candy, chocolate bars	milk, plain	4 015	28.96
Candy, other	chewing gum	10 433	20.15
Coffee	brewed	20 962	446.66
Tea	brewed	21 778	548.21
Soft drinks	cola type	13 634	371.18
Soft drinks, low-calorie	diet drinks	178	313.04
Wine	table wine (12.2% alcohol)	941	237.47
Beer	—	3 039	935.34
Spirits	gin, rum, vodka, whiskey	1 415	86.75
Wild game (large)	caribou, cooked	891	123.42
Wild game (small)	hare or rabbit	123	103.29
Wild birds	duck or snow goose	124	93.29
Sauces and gravies	gravy	4 422	69.50
Miscellaneous, condiments	mustard, yellow	4 289	12.98

\* number of eating occasions of the foods in each composite for all individuals (including Indians, Inuit and Northern Whites).

— not applicable

**Table 2:**

**First 50 food composites, in descending order of number of mentions  
or eating occasions, from Nutrition Canada Survey 1971-72**

Food Name	Number of mentions
Sugar	33 133
Bread, white	32 697
Milk, whole	26 558
Butter	23 326
Tea	21 778
Coffee	20 962
Soft drinks	13 634
Milk, evaporated	12 855
Potatoes, boiled	12 743
Margarine	12 724
Candy, other	10 433
Milk, 2%	10 094
Cookies	10 001
Eggs	7 815
Vegetable oil (incl. mayonnaise)	7 594
Soup	7 032
Jam	6 846
Cake	6 046
Pork, fresh	5 484
Milk, skim	5 092
Apples	5 050
Crackers	4 916
Green, leafy vegetables	4 847
Bread, whole-wheat	4 823
Tomatoes	4 764
Carrots	4 721
Poultry	4 673
Beef, roast	4 615
Sauces and gravies	4 422
Beef, ground	4 412
Miscellaneous condiments	4 289
Cream	4 281
Ice Cream	4 185
Candy, chocolate bars	4 015
Citrus juice	3 973
Onions	3 891
Cold cuts	3 865
Fish	3 865

Table 2 (continued)

Food Name	Number of mentions
Rolls and buns	3 813
Citrus fruit	3 636
Potatoes, fried	3 373
Tomato condiments	3 208
Peas, green	3 107
Pie	3 050
Beer	3 039
Cheese, processed	2 776
Peanut butter	2 753
Pork, cured	2 669
Cucumber condiments	2 665
Cheese, natural	2 472

Table 3:

First 50 food composites, in descending order, by number of eaters and percentage of eaters consuming composite, Nutrition Canada Survey, 1971-72

Food name	Number of eaters*	Eating composite* (%)
Bread, white	10 446	81.6
Sugar	8 656	67.6
Potatoes, boiled	7 645	59.7
Butter	7 403	57.9
Milk, whole	6 772	52.9
Coffee	5 913	46.2
Tea	5 507	43.0
Soft drinks	5 301	41.4
Cookies	4 883	38.2
Eggs	4 721	36.9
Margarine	4 429	34.6
Candy, other	4 176	32.6
Soup	4 076	31.9
Jams	3 764	29.4
Vegetable oil (incl. mayonnaise)	3 705	29.0
Cake	3 470	27.1
Pork, fresh	3 222	25.2

Table 3 (continued)

Food name	Number of eaters	Eating composite <sup>+</sup> (%)
Carrots	2 938	23.0
Apples	2 846	22.2
Green, leafy vegetables	2 840	22.2
Sauces and gravies	2 784	21.8
Milk, evaporated	2 747	21.5
Tomatoes	2 740	21.4
Beef, roast	2 721	21.3
Ice cream	2 633	20.6
Beef, ground	2 627	20.5
Milk, 2%	2 618	20.5
Poultry	2 594	20.3
Crackers	2 576	20.1
Miscellaneous condiments	2 463	19.2
Onions	2 273	17.8
Candy, chocolate bars	2 253	17.6
Cold cuts	2 245	17.5
Potatoes, fried	2 169	17.0
Citrus juice	2 163	16.9
Peas	2 076	16.2
Rolls and biscuits	2 075	16.2
Bread, whole-wheat	1 969	15.4
Citrus fruit	1 920	15.0
Tomato condiments	1 899	14.8
Pie	1 893	14.8
Cheese, processed	1 689	13.2
Pork, cured	1 661	13.0
Cream	1 612	12.6
Peanut butter	1 602	12.5
Cucumber condiments	1 587	12.4
Potato chips	1 516	11.8
Milk, skim	1 503	11.7
Cheese, natural	1 420	11.1
Rutabagas	1 376	10.8

\* excluding Indians, Inuit and Northern Whites

+ percentage of the 12 796 individuals surveyed throughout the 10 provinces.



Table 4:

**Food composites, in descending order of calories,  
from Nutrition Canada Survey, 1971-72**

Food name	Grams per day	Energy	
		(kcal)	(kJ)
Pasta, mixed dishes	357	767	3 209
Puddings	116	535	2 238
Potatoes, fried	157	495	2 071
Pizza	168	475	1 987
Beer	935	412	1 724
Cake	94	353	1 477
Pork, sausages	96	353	1 477
Lamb	116	323	1 351
Beef, steak	129	310	1 318
Pie	121	309	1 293
Beef, ground	105	303	1 268
Wild birds	93	283	1 184
Beef, roast	90	259	1 176
Milk, whole	410	252	1 054
Cookies	50	246	1 029
Danish and doughnuts	78	245	1 025
Bread, white	90	243	1 017
Peanuts	42	241	1 008
Fish, fresh or frozen	140	238	996
Pork, roasted	82	231	967
Wild game (small)	103	223	933
Milk, 2%	442	220	920
Wild game (large)	123	215	900
Bread, whole-wheat	86	210	879
Pancakes	91	210	879
Muffins	80	208	870
Veal	187	203	849
Poultry	103	201	841
Spirits	87	200	837
Cold cuts	63	199	833
Rolls and buns	67	199	833
Cheese, natural	48	191	799
Ice cream	89	179	749
Pasta, plain	153	170	711
Beans, mature	171	168	703
Organ meats	77	166	695

**Table 4** (continued)

Food name	Grams per day	Energy	
		(kcal)	(kJ)
Wine	237	166	695
Butter	23	162	678
Wieners	50	160	669
Potato chips	30	159	665
Syrup	53	152	636
Soft drinks	371	152	636
Candy, chocolate bars	29	151	632
Rice, cooked	138	151	632
Margarine	21	149	623
Cereals, oats, cooked	236	146	611
Pork, cured	25	145	607
Eggs	79	142	594
Potatoes, boiled	163	140	586
Peanut butter	23	134	561

**Table 5:**

**Food composites, in descending order of total fat,  
from Nutrition Canada Survey, 1971-72**

Food name	Grams per day	Fat (g)
Pasta, mixed dishes	357	39.6
Sausages	96	29.8
Potatoes, fried	157	26.0
Puddings	116	24.0
Pizza	168	22.4
Lamb	116	21.9
Beef, ground	105	21.7
Peanuts	42	20.5
Wild birds	93	20.3
Butter	23	18.3
Cold cuts	63	17.8
Beef, steak	129	17.7
Margarine	21	16.7
Cheese, natural	48	15.8
Pork, fresh	82	15.2
Beef, roast	90	15.0
Cake	94	15.0
Wieners	50	14.5
Animal fat	14	14.0

Table 5 (continued)

Food name	Grams per day	Fat (g)
Milk, whole	410	13.7
Pie	121	13.4
Pork, cured	25	12.4
Peanut butter	23	11.6
Veal	87	11.6
Cookies	50	11.2
Eggs	79	11.0
Vegetable oil (incl. mayonnaise)	13	10.6
Potato chips	30	10.4
Wild game (small)	103	10.4
Cheese, processed	33	10.3
Ice cream	89	9.6
Candy, chocolate bars	29	9.4
Milk, 2%	442	8.5
Poultry	103	8.3
Muffins	80	7.8
Fish, fresh or frozen	140	7.4
Nuts, other	12	7.4
Danish and doughnuts	78	7.1
Pancakes	91	6.4
Organ meats	77	6.1
Popcorn	27	5.9
Milk, evaporated	73	5.7
Fish, canned	61	5.0
Cream	46	4.6
Rolls and buns	67	3.7
Cheese, cottage	78	3.5
Crackers	22	2.9
Bread, white	90	2.9
Sauces and gravies	70	2.8
Bread, whole-wheat	86	2.6

Table 6:

**Food composites, in descending order of total saturated fatty acids,  
from Nutrition Canada Survey, 1971-72**

Food name	Grams per day	Total saturates (g)
Pasta, mixed dishes	357	21.2
Lamb	116	12.2
Butter	23	11.4
Potatoes, fried	157	10.7
Sausages	96	10.3
Cheese, natural	48	10.0
Milk, whole	410	8.5
Beef, ground	105	8.5
Cold cuts	63	6.7
Cheese, processed	33	6.5
Wild birds	93	6.4
Beef, steak	129	6.3
Beef, roast	90	6.2
Ice cream	89	5.9
Pizza1	68	5.7
Pork, fresh	82	5.5
Animal fat	14	5.5
Wieners	50	5.4
Milk, 2%	442	5.3
Candy, chocolate bars	29	5.2
Veal	187	5.0
Pork, cured	25	4.4
Fish, fresh or frozen	140	4.3
Popcorn	27	4.3
Eggs	79	4.1
Cake	94	4.0
Milk, evaporated	73	3.5
Pie	21	3.5
Margarine	21	3.1
Cookies	50	3.0
Cream	46	2.9
Peanuts	42	2.8
Muffins	80	2.4
Cheese, cottage	78	2.2
Poultry	103	2.2
Organ meats	77	2.2
Peanut butter	23	1.9
Pancakes	91	1.6
Danish and doughnuts	78	1.6

Table 6 (continued)

Food name	Grams per day	Total saturates (g)
Yogurt	144	1.4
Fish, canned	61	1.4
Potato chips	30	1.2
Vegetable oil (incl. mayonnaise)	13	1.0
Sauces and gravies	70	0.9
Rolls and buns	69	0.9
Crackers	22	0.7
Nuts and seeds, other	12	0.7
Bread, white	90	0.7
Beans, mature	171	0.7
Bread, whole-wheat	86	0.5

Table 7:

Food composites, in descending order of total monounsaturated fatty acids, from Nutrition Canada Survey, 1971-72

Food name	Grams per day	Total monounsaturates (g)
Sausages	96	13.3
Pasta, mixed	357	13.1
Potatoes, fried	157	12.6
Margarine	21	12.5
Peanuts	42	10.2
Wild birds	93	9.5
Beef, ground	105	9.5
Cold cuts	63	8.4
Pizza	168	7.9
Lamb	116	7.9
Beef, steak	129	7.6
Cake	94	7.4
Pork, fresh	82	7.0
Wieners	50	6.8
Beef, roast	90	6.7
Pie	121	6.6
Animal fat	14	6.3
Pork, cured	25	6.0
Vegetable oil (incl. mayonnaise)	13	5.9
Potato chips	30	5.7
Peanut butter	23	5.6

Table 7 (continued)

Food name	Grams per day	Total monounsaturates (g)
Cookies	50	5.5
Butter	23	5.3
Veal	87	4.8
Cheese, natural	48	4.5
Eggs	79	4.1
Milk, whole	410	4.0
Danish and doughnuts	78	3.9
Muffins	80	3.5
Candy, chocolate bars	29	3.4
Pancakes	91	3.1
Poultry	103	3.0
Cheese, processed	33	2.9
Ice cream	89	2.8
Milk, 2%	442	2.5
Fish, fresh or frozen	140	2.0
Rolls and buns	67	1.8
Milk, evaporated	73	1.8
Nuts and seeds, other	12	1.7
Crackers	22	1.4
Cream	46	1.3
Bread, white	90	1.3
Organ meats	77	1.3
Sauces and gravies	70	1.2
Fish, canned	61	1.1
Bread, whole-wheat	86	1.0
Cheese, cottage	78	1.0
Cereals, oats, cooked	236	0.9
Beans, mature	171	0.8
Popcorn	27	0.6

Table 8:

Food composites, in descending order of total polyunsaturated fatty acids, from Nutrition Canada Survey, 1971-72

Food name	Grams per day	Total polyunsaturates (g)
Peanuts	42	6.5
Nuts and seeds, other	12	4.7
Sausages	96	3.7
Vegetable oil (incl. mayonnaise)	13	3.5
Peanut butter	23	3.5



Table 8 (continued)

Food name	Grams per day	Total polyunsaturates (g)
Cake	94	3.2
Pie	121	2.9
Potato chips	30	2.8
Wild birds	93	2.3
Cookies	50	2.3
Poultry	103	2.0
Pizza	168	2.0
Pork, fresh	82	1.7
Pasta, mixed dishes	357	1.7
Potatoes, fried	157	1.6
Animal fat	14	1.6
Cold cuts	63	1.5
Pork, cured	25	1.5
Muffins	80	1.4
Organ meats	77	1.4
Wieners	50	1.4
Pancakes	91	1.3
Eggs	79	1.2
Cereals, oats, cooked	236	1.0
Margarine	21	1.0
Fish, canned	61	1.0
Rolls and buns	67	0.9
Bread, whole-wheat	86	0.8
Beef, ground	105	0.8
Danish and doughnuts	78	0.8
Bread, white	78	0.8
Crackers	22	0.7
Cereals, oats, dry	24	0.7
Butter	23	0.7
Beef, steak	129	0.7
Veal	87	0.7
Lamb	116	0.7
Fish, fresh or frozen	140	0.6
Beef, roast	90	0.6
Popcorn	27	0.6
Corn	111	0.5
Milk, whole	410	0.5
Cheese, natural	48	0.4
Sauces and gravies	70	0.4
Ice cream	89	0.4
Cheese, processed	33	0.3
Milk, 2%	442	0.3
Cherries	86	0.3
Beans, mature	164	0.2
Candy, chocolate bars	29	0.2

Table 9:

**Food composites, in descending order of cholesterol,  
from Nutrition Canada Survey, 1971-72**

Food name	Grams per day	Cholesterol (mg)
Eggs	79	467
Organ meats	77	369
Pasta, mixed dishes	357	121
Fish, fresh or frozen	140	114
Lamb	116	113
Shellfish	74	111
Beef, steak	129	99
Poultry	103	97
Veal	87	88
Wild birds	93	84
Muffins	80	82
Sausages	96	79
Beef, ground	105	77
Beef, roast	90	73
Pork, fresh	82	58
Milk, whole	410	56
Cheese, natural	48	50
Butter	23	49
Pizza	168	49
Pancakes	91	48
Ice cream	89	40
Fish, canned	61	40
Cold cuts	63	35
Milk, 2%	442	33
Cheese, processed	33	31
Wieners	50	25
Milk, evaporated	73	22
Pork, cured	25	21
Potatoes, fried	157	20
Cookies	50	19
Cream	46	14
Pork, fresh	14	13
Cheese, cottage	78	12
Beans, mature	164	12
Yogurt	144	9
Vegetable oil (incl. mayonnaise)	13	8
Danish and doughnuts	78	7
Milk, skim	377	7
Candy, chocolate bars	29	6
Rolls and buns	67	4
Cake	94	3
Bread, white	90	3
Bread, whole-wheat	86	3
Sauces and gravies	70	2

Table 10:

Food composites, in descending order of calcium,  
from Nutrition Canada Survey, 1971-72

Food name	Grams per day	Calcium (mg)
Pasta, mixed dishes	357	645
Milk, 2%	442	538
Milk, whole	410	490
Milk, skim	377	465
Cheese, natural	48	343
Pizza	168	317
Yogurt	144	263
Cheese, processed	33	202
Milk, evaporated	73	191
Broccoli	136	155
Rhubarb	107	155
Ice cream	89	117
Muffins	80	113
Beans, mature	171	96
Pancakes	91	92
Bread, whole-wheat	86	86
Shellfish	74	85
Puddings	116	78
Bread, white	90	76
Citrus fruit	183	73
Danish and doughnuts	78	66
Candy, chocolate bars	29	66
Cake	94	59
Rolls and buns	67	49
Cream	46	49
Cheese, cottage	78	47
Beer	935	47
Eggs	79	44
Fish, fresh or frozen	140	43
Peanuts	42	37
Squash	121	33
Sausages	96	31
Melons	379	30
Potatoes, fried	157	30
Cereals, oats, dry	24	28
Cabbage	78	26
Syrup	53	24
Wild game (large)	123	23
Wild game (small)	103	22
Rutabagas	50	21
Cauliflower	75	20
Citrus juice	212	19
Wine	237	19

**Table 10** (*continued*)

Food name	Grams per day	Calcium (mg)
Cereals, oats, cooked	236	19
Carrots	57	18
Beans, green	66	17
Fruit juice (non-citric)	225	16
Tomato juice	172	16
Soup	243	15
Celery	40	14

**Table 11:**

**Food composites, in descending order of iron,  
from Nutrition Canada Survey, 1971-72**

Food name	Grams per day	Iron (mg)
Cereals, wheat, cooked	184	11.1
Beans, mature	171	5.6
Organ meats	77	4.8
Wild game (large)	123	4.2
Cereals, corn, dry	28	3.8
Cereals, oats, dry	24	3.2
Puddings	116	2.9
Beef, steak	129	2.8
Pasta, mixed dishes	357	2.8
Muffins	80	2.8
Wild birds	93	2.6
Bread, whole-wheat	86	2.6
Beef, ground	105	2.6
Beef, roast	90	2.3
Shellfish	74	2.3
Bread, white	90	2.2
Cereals, rice, dry	16	2.2
Syrup	52	2.2
Pizza	168	2.1
Danish and doughnuts	78	2.0
Lamb	116	2.0
Rolls and buns	67	1.7
Cereals, oats, cooked	236	1.6
Eggs	79	1.6
Broccoli	136	1.6
Wild game (small)	103	1.6
Pancakes	91	1.5
Poultry	103	1.4

**Table 11** (*continued*)

Food name	Grams per day	Iron (mg)
Fish, fresh or frozen	140	1.4
Sausages	96	1.2
Fish, canned	61	1.2
Potatoes, fried	157	1.2
Pie	121	1.1
Cake	94	1.0
Tomato juice	172	1.0
Wine	237	1.0
Cereals, wheat, dry	31	1.0
Corn	111	1.0
Luncheon meats	63	1.0
Veal	87	0.9
Cookies	50	0.9
Fruit juice (non-citric)	225	0.8
Pork, fresh	82	0.8
Crackers	22	0.8
Peanuts	42	0.8
Melons	379	0.6
Pasta, plain	153	0.6
Beans, green	67	0.6
Wieners	50	0.6
Popcorn	27	0.6

**Table 12:**

**Food composites, in descending order of sodium,  
from Nutrition Canada Survey, 1971-72**

Food name	Grams per day	Sodium (mg)
Pasta, mixed dishes	357	1 940
Sausages	96	1 240
Pizza	168	1 120
Soups	243	792
Beans, mature	171	752
Cold cuts	63	641
Tomato juice	172	622
Wieners	50	559
Popcorn	27	526
Rice, cooked	138	518
Fish, canned	61	492
Cheese, processed	33	470
Bread, white	90	457
Bread, whole-wheat	86	455
Pork, cured	25	401

Table 12 (continued)

Food name	Grams per day	Sodium (mg)
Pancakes	91	387
Pie	121	363
Corn	111	358
Muffins	80	356
Potatoes, fried	157	339
Rolls and buns	67	338
Puddings	116	318
Cheese, cottage	78	317
Cake	94	304
Danish and doughnuts	78	302
Cheese, natural	48	295
Wild birds	93	281
Cereals, corn, dry	28	277
Tomato condiments	26	274
Egg, fried	79	246
Crackers	22	245
Cookies	50	240
Cucumber condiments	33	236
Mushrooms	53	225
Milk, 2%	442	221
Sauces and gravies	70	218
Cereals, oats, dry	24	215
Milk, whole	410	201
Margarine	21	195
Milk, skim	377	194
Butter	23	187
Peanuts	42	180
Cereals, rice, dry	16	171
Beans, green	67	167
Miscellaneous condiments	13	163
Potato chips	30	157
Fish, fresh or frozen	140	154
Peas, green	56	123
Peanut butter	23	107
Shellfish	74	104



Table 13:

Food composites, in descending order of total dietary fibre,  
from Nutrition Canada Survey, 1971-72

Food name	Grams per day	Total dietary fibre (mg)
Muffins	80	7.4
Corn	111	6.3
Cereals, oats, cooked	236	5.2
Potatoes, fried	157	5.0
Bread, whole-wheat	86	4.9
Peanuts	42	3.9
Beans, mature	171	3.8
Pizza	168	3.4
Citrus fruit	183	3.3
Cereals, wheat, dry	31	3.2
Broccoli	136	3.2
Pears	142	2.9
Apples	130	2.5
Peas, green	56	2.5
Potatoes, boiled	163	2.4
Popcorn	27	2.2
Rhubarb	107	2.1
Pasta, mixed dishes	357	2.1
Bananas	113	2.0
Squash	121	1.9
Strawberries	91	1.9
Plums	118	1.8
Pie	121	1.7
Bread, white	90	1.6
Pasta, plain	153	1.6
Carrots	57	1.6
Cereals, oats, dry	24	1.6
Mushrooms	53	1.5
Danish and doughnuts	78	1.5
Beans, green	67	1.5
Cabbage	78	1.4
Peaches	134	1.3
Cauliflower	75	1.3
Rolls and buns	67	1.3
Cereals, wheat, cooked	184	1.3
Potato chips	30	1.2
Grapes	99	1.2
Peanut butter	23	1.2
Tomato juice	172	1.2
Pancakes	91	1.2
Beets	50	1.1
Melons	379	1.1

Table 13 (continued)

Food name	Grams per day	Total dietary fibre (mg)
Rutabagas	50	1.1
Cherries	86	1.0
Tomatoes	76	1.0
Candy, chocolate bars	29	0.8
Raisins	19	0.7
Pineapple	92	0.6
Cucumber condiments	33	0.6
Nuts and seeds, other	12	0.6



## Appendix IV

### Cost of Nutritious Food Basket

Agriculture Canada revises its definition of the Nutritious Food Basket (NFB) every four years. The latest revision, in 1989, took into account changes in the food purchasing patterns of Canadians that occurred between 1982 and 1986. The nutritional criteria used to identify the food items in the basket, and their proportion, were also modified. Because the updated Nutrition Recommendations were not available at the time of the revision, the changes were made to reflect current nutritional thought.

Maximum percentage of total energy to be provided as fat by foods selected for the basket was reduced from 35% to 30%. Adjustments were made to include foods that would increase dietary fibre intake. Foods were also selected to assist women to meet calcium requirements, which were increased by 10% from the 1983 Recommended Nutrient Intakes for calcium.

**Table 1:**

**Average costs of the Agriculture Canada Nutritious Food Basket (NFB)  
for a family of four,<sup>a</sup> Toronto, September 1988 (using 1985 and 1989 definitions)**

Food Category	NFB (1985 definition)			NFB <sup>b</sup> (1989 definition)		
	Qty/4 (\$)	Cost (\$)	NFB Cost (\$)	Qty/4 (\$)	Cost (\$)	NFB Cost (\$)
Dairy	17.00	1.52	25.84	17.75	1.54	27.34
Eggs	23.00	.12	2.69	18.00	.12	2.16
Meat, poultry and fish	3.85	6.51	25.05	3.95	6.44	25.44
Meat alternates	0.95	3.87	3.67	0.95	3.72	3.53
Cereal and bakery	7.00	2.93	20.50	7.10	3.03	21.51
Citrus and tomatoes	1.60	1.91	3.05	3.30	1.79	5.91
Other fruit	3.40	2.63	8.94	6.25	2.38	14.88
Potatoes	5.75	.61	3.51	7.55	.64	4.83
Other vegetables	6.80	1.75	11.90	6.90	1.74	12.01
Fats and oils	1.45	4.05	5.88	0.90	3.99	3.59
Sugars and sweets	0.90	1.58	<u>1.42</u>	1.10	1.11	<u>1.58</u>
			112.45			122.78
Miscellaneous			4.68 (4%)			6.14 (5%)
<b>Total</b>			<b>\$117.13</b>			<b>\$128.92</b>

<sup>a</sup> Family of four consists of a girl (7-9 years), boy (13-15 years) and a man and woman (25 to 49 years).

<sup>b</sup> 1989 Nutritious Food Basket has taken into account increased calcium requirements for women, higher levels of dietary fibre and lower levels of fat (30% of calories from fat)

Table 1 shows the costs of the Agriculture Canada NFB in the same city during the same month, using the 1985 definition (based on the 1983 Recommended Nutrient Intakes and 35% of energy from fat) and the 1989 definition described above. Therefore, the price differential primarily reflects a shift towards a lower-fat, higher-fibre diet.

# Appendix V

## Food Away From Home

### Introduction

This report was written to support the work of the Communications/Implementation Committee in revising the Nutrition Recommendations for Canadians.

Information on the nutritional status and current eating habits of Canadians is essential as a base for an effective implementation strategy for nutrition recommendations. Food service accounts for one third of all food consumed in Canada.<sup>1</sup> Exact consumption data are not available. However, consumer surveys such as Info Study<sup>2</sup> and the Family Food Expenditure Survey<sup>3</sup> from Statistics Canada paint a fairly reliable picture of foods consumed away from home.

The nutritional aspects of food consumed away from home are covered under food consumption trends in another section of the Task Group's submission.

The types of foods consumed away from home change according to such factors as consumer demand, price of ingredients, availability, ease of preparation and nutrition concerns. Nutrition recommendations can have a positive effect on food service trends. Current trends in food service,

observed by market share figures between 1985 and 1988, indicated increased consumption of soups, sandwiches and salads and decreased consumption of hamburgers and chicken (Info Study.). The hamburger market share dropped to 48% (representing a 16% decrease), chicken dropped to 9% (representing a 30% decrease), whereas soups, salads and sandwiches rose to 33%, which represents a 65% market share gain.

### Market Share

From 1981 to 1988, food service sales increased in Canada by 45% (Canadian Restaurant and Foodservices Association). In 1988, food service sales represented 37% of consumers' total food expenditures (CRFA). A significant shift from at-home food consumption to consumption in restaurants and other food service establishments has been noted since 1983, when food consumed away from home represented only 18% of market share (Info Study). The average Canadian ate away from home 144 times, or nearly three times per week, in 1987 (Info Study).

The figures in this report do not include take-out foods from supermarkets.

- 1 Canadian Restaurant and Foodservices Association. Infostats 1988 Foodservice Facts. These statistics were developed by the CRFA, using Statistics Canada Family Food Expenditure Survey data and internal information. Annual report (Canadian Restaurant and Foodservices Association, 80 Bloor Street West, Suite 1201, Toronto M5S 2V1, (416) 923-8416, 1-800-387-5649).
- 2 Parnell Kerr Forster and Market Facts of Canada Limited, Info Study (1983 to present). This study is based on representative samples of 1300 households which are surveyed on a quarterly basis each year (Parnell Kerr Forster, Management Consultants, 350 Sparks Street, Ottawa K1R 7S8, (613) 563-0210; Market Facts, 77 Bloor Street West, 120, Toronto M5S 3A4, (416) 964-6262).
- 3 Statistics Canada, Family Food Expenditures in Canada, 1986 (Ottawa: Minister of Supply and Services Canada, 1989).



## Sources of Food Away from Home

Table 1:

## Food service food and beverage sales projections, 1988

Food service locations	Projection (%)
Restaurants — licensed	29%
— unlicensed	19%
Institutions	15%
Accommodation food service	14%
Take-out and delivery	9%
Social and contract caterers	5%
Taverns	5%
Other retail food service	1%
Department stores	1%
Vending	1%
Motion picture theatres	.5%

Source: Canadian Restaurant and Foodservices Association, *Infostats 1988 Foodservice Facts*.

The largest growth areas in food service are take-out and delivery, catering and fast food, based on a comparison of food service industry performance in 1987 and 1988 (CRFA).

**Meals**

The meal most frequently consumed away from home is lunch, followed by dinner, then breakfast. During 1988, according to Info Study, the most common time period for eating away from home was from 11:30 a.m. to 2 p.m. (lunch), with 45% of all meal occasions, followed by the period from 5 to 8 p.m. (dinner), with 34%. The strongest time period for snacks is also the lunch period, with

28%, followed by the 2 to 5 p.m. period at 21%, and the evening period (after 8 p.m.) at 15%. In 1988, 60% of all meals consumed away from home were during the week, while weekend away-from-home meals accounted for 40% of all meals. Info Study noted a shift towards weekday dining-out in both meals and snacks between 1985 and 1986.

Table 2:

## Meal period and weekday/weekend market share

Meal	Info Study	Market Share	
		Family Food Expenditure	Fast Track
Breakfast	14.0%	14.0%	16%
Lunch	45.0%	49.0%	50%
Dinner	34.0%	37.0%	34%
<b>Time of the week</b>			
Weekend	40.0%	—	42%
Weekday	60.0%	—	58%

— data unknown

Sources: Parnell Kerr Forster and Market Facts of Canada Ltd., *Info Study*, 1988; Statistics Canada, *Family Food Expenditure in Canada*, 1986; Burak Jacobson, *Fast Track*, 1988.

A comparison of three studies which explored the frequency of meals eaten away from home show very consistent results (Table 2).

Canadian consumers spend \$6 billion a year on fast food, which is approximately one quarter of total food service revenue.

## Fast Foods

Fast-food consumption<sup>4</sup>

Fast-food outlets, as defined by Fast Track, are those chain restaurants which offer relatively quick service from a limited menu. They offer any of the following: eat-in facilities, home delivery or take-out. Examples of fast-food outlets identified by respondents to the study include McDonald's, Burger King, Swiss Chalet, Mother's, Licks, Pizza Hut, St. Hubert's, Tim Horton's, Arby's, White Spot, Cultures and 7-Eleven.

<sup>4</sup> Burak Jacobson, *Fast Track* 1988. This survey is based on 875 interviews per month of people 10 years and older who eat fast food. It is an industry-performance monitor for fast-food marketers (Burak Jacobson Research Partners Inc., 11 Church Street, Toronto, Ontario M5E 1W1, (416) 363-5111).

Table 3:

## Fast-food market segment shares, by chain type, 1988

Region	Hamburger	Chicken	Pizza	Soup/sand./sub.
Canada (Total)	55%	15%	11%	6%
Atlantic provinces	55%	14%	15%	1%
Quebec	52%	19%	6%	6%
Ontario	51%	18%	15%	6%
Prairie provinces	62%	10%	8%	3%
British Columbia	68%	3%	6%	8%

Source: Burak Jacobson, *Fast Track*, 1988.

Fast-food consumption across the country corresponds roughly to regional population — for example, British Columbia has 11% of Canada's population and its residents account for 11% of all fast-food eating occasions in Canada. Regional food preferences, however, vary considerably (Table 3). In British Columbia and the Prairies, hamburgers are strongly preferred. Pizza is more popular in Ontario and the Atlantic provinces than it is elsewhere in Canada, and chicken is most popular in Ontario and Quebec.

About half of all eating occasions for fast foods are in the restaurant itself. The remainder are at home (25%), at work (6%), in the car (12%) or somewhere else (4%).

## Diner Profile

Canadians dine out, on average, three times per week, or 144 times per year (Info Study, 1987). Men consume twice as many meals away from home as do women (264, compared to 125 meals per year) according to Statistics Canada (Family Food Expenditure Survey). Ontario residents eat out, on average, 154 times per year per person, which is more often than people in any other province eat away from home (Info Study, 1987). People with higher incomes eat out twice as often as those with low incomes. They also eat out less frequently at breakfast, more frequently at lunch and as frequently at dinner, as low-income people (Info Study, 1987). Compared to lower-income Canadians, people with higher incomes eat more often at table-service restaurants and less often at drive-throughs or take-outs (Info Study, 1987).

## Food Preferences

Table 4:

Top food items ordered away from home, 1987  
(percentage of market)

Food item	Total market %	Fast food %	Cafeteria %	Table service %
French fries	23	38	12	16
Hamburger	16	34	6	—
Salad, coleslaw	14	7	13	20
Sandwich, submarine	11	12	18	7
Bread, toast	—	—	—	—
Muffin, bagel	10	7	11	12
Soup	9	—	18	11
Vegetables	8	—	9	13
Cake, pie, other	—	—	—	—
Other pastry	8	5	10	9
Other potato	7	—	5	11
Pizza	6	7	—	7
Fried chicken	—	6	—	—
Ice cream	—	5	—	—
Hot dog	—	5	—	—
Seafood	—	—	—	7
Other food	—	—	6	—

— data not available

Source: Parnell Kerr Forster and Market Facts of Canada Ltd., *Info Study*, 1987.

Restaurateurs report that health and nutrition is a major consideration in their decisions about which items to serve (65% say important/very

important); which additives to avoid using<sup>5</sup> (65%); and how foods should be prepared (78%).

5 Readex/MacLean Hunter Research Bureau Readership Survey, 1988. This study, which reached 276 English-language participants and 171 French-language participants, is a demographic and operational profile of restaurateurs in the Canadian commercial food service industry (MacLean Hunter Research Bureau, 777 Bay Street, Toronto, Ontario M5W 1A7, (416) 596-5284.)

Table 5:

**Growth areas and areas of decrease in food service, 1987-1988**

Increased sales of	%
Bar and Mexican snacks	44
Pasta	22
Canned fish	14
Cookies, crackers, bread	11
Salad dressings	11
Juices	11
Decreased sales of	
Coffee	20
Juice drinks	5

Source: Food Service Market Insight Inc., 1987-1988 (677 Jarvis Street, Toronto M4Y 2J8, (416) 967-7730).

**Recommendations**

1. The Communications/Implementation Committee has an opportunity to recommend to representatives of the food service industry that they form partnerships with nutrition educators in the dissemination and implementation of nutrition recommendations for Canadians. Food service operators could be encouraged to make available and promote appropriate food choices and food preparation methods.
2. The Canadian Restaurant and Foodservices Association has shown leadership in addressing issues including allergy information, sulphite usage and heart health and nutrition information. Representatives of the CRFA should be consulted by the Communications/Implementation Committee in the development of education and implementation strategies.
3. Restaurant menus, table tents, special menus and inserts provide opportunities to communicate nutrition education messages.

# Appendix VI

## Food Group and Item Classification

Table 1.

Food group and item classification for  
Apparent Per Capita Food Consumption in Canada data

### Cereal Products

Wheat flour  
Rye flour  
Oatmeal and rolled oats  
Pot and pearl barley  
Corn flour and meal  
Buckwheat flour  
Rice  
Breakfast food

### Sugar

Refined sugar  
Maple sugar  
Honey  
Other sugars and syrups

### Pulses and nuts

Dry beans  
Baked canned beans  
Dry peas  
Peanuts  
Tree nuts

### Fats and oils

Margarine  
Shortening and shortening oils  
Salad oils  
Butter  
Lard

### Fruits\*

Tomatoes, fresh  
Tomatoes, canned  
Tomato juice  
Tomato pulp, paste and puree  
Tomato ketchup  
Tomatoes, otherwise used  
Oranges, fresh  
Orange juice  
Lemons, fresh  
Lemon juice  
Grapefruit, fresh  
Grapefruit juice  
Apples, fresh  
Apples, canned  
Apple juice  
Apples, frozen  
Apples, dried  
Applesauce  
Apple pie filling  
Apples, otherwise used  
Apricots, fresh  
Apricots, canned  
Apricots, frozen  
Bananas, fresh  
Blueberries, fresh  
Blueberries, canned  
Blueberries, frozen  
Cherries, fresh  
Cherries, canned  
Cherries, frozen  
Cranberries, fresh  
Grapes, fresh  
Grape juice  
Melons, fresh  
Peaches, fresh  
Peaches, canned

Peaches, frozen  
Pears, fresh  
Pears, canned  
Pineapple, fresh  
Pineapple, canned  
Pineapple juice  
Plums, fresh  
Plums, canned  
Plums, frozen  
Raspberries, fresh  
Raspberries, canned  
Raspberries, frozen  
Strawberries, fresh  
Strawberries, canned  
Strawberries, frozen  
Unspecified, fresh  
Unspecified, canned  
Unspecified, juice  
Unspecified, frozen  
Unspecified, dried  
Jams, jellies, marmalades  
Unspecified, other

### Vegetables\*\*

Spinach, fresh  
Spinach, canned  
Spinach, frozen  
Broccoli, fresh  
Broccoli, frozen  
Carrots, fresh  
Carrots, canned  
Carrots, frozen  
Pumpkin and squash, canned  
Cabbage, fresh  
Lettuce, fresh  
Asparagus, fresh



Table 1 (continued)

Asparagus, canned	<b>Potatoes</b>	Processed cheese
Asparagus, frozen	Potatoes, white	Variety cheese
Beans, fresh	Potatoes, sweet	Cottage cheese
Beans, canned		Skim milk cheese
Beans, frozen		Whey cheese
Lima beans, frozen		Powdered skim milk
Beets, fresh	<b>Meat</b>	Powdered buttermilk
Beets, canned	Pork	Other whole milk products
Brussels sprouts, fresh	Beef	Miscellaneous by-products
Brussels sprouts, frozen	Veal	Evaporated whole milk
Cauliflower, fresh	Mutton and lamb	Condensed whole milk
Cauliflower, frozen	Offal	Evaporated partly skimmed milk
Celery, fresh	Canned Meat	Condensed skim milk
Corn, fresh		Milkshake mix
Corn, canned		Ice cream
Corn, frozen		Sherbet
Cucumbers, fresh	<b>Eggs</b>	Ice milk
Onions, not processed	Eggs, fresh	Fluid buttermilk
Parsnips, fresh		Chocolate drink
Peas, fresh		Cereal cream
Peas, canned		Table cream
Peas, frozen	<b>Poultry</b>	Whipping cream
Peppers, fresh	Chicken	Sour cream
Radishes, fresh	Fowl	Yogurt
Rutabagas, fresh	Turkey	Powdered whole milk
Unspecified, fresh	Duck	Standard milk
Unspecified, canned	Goose	Fluid partly skimmed milk
Unspecified, frozen		Fluid skim milk
Unspecified, other		
<b>Mushrooms</b>	<b>Fish and shellfish</b>	<b>Beverages</b>
Mushrooms, fresh	Fresh, frozen	Coffee
Mushrooms, canned	Smoked, salted, cured	Tea
	Canned	Cocoa
		Ale, beer, stout and porter
	<b>Dairy products***</b>	Spirits
	Cheddar cheese	Wines
		Soft drinks

\* Subgroup data available for citrus fruit and other fruit.

\*\* Subgroup data available for dark green and orange-yellow vegetables.

\*\*\* Subgroup data available for cheeses, fluid milks and other dairy products.

Source: Statistics Canada, *Apparent Per Capita Food Consumption in Canada*, Catalogue No. 32-229/230 (Ottawa: Minister of Supply and Services Canada), annual.

Table 2.

**Food group and item classification  
for Family Food Expenditure Survey data**

<b>Beef</b>  Hip cuts Loin cuts Rib cuts Chuck cuts Stewing beef Carcass Other Wieners	<b>Poultry</b>  Chicken Turkey Other  <b>Fish</b>  Cod, fresh Flounder and sole, fresh Haddock, fresh Salmon, fresh Other sea, fresh Freshwater, fresh Pre-cooked portions Cured fish Canned salmon Canned tuna Other canned fish Shrimp Other shellfish Other marine products	<b>Meat alternates</b>  Eggs Unshelled nuts Shelled nuts Other nuts Dried vegetables Canned baked beans Other canned beans Peanut butter
<b>Pork</b>  Leg cuts Loin cuts Belly cuts Shoulder cuts Carcass Other Bacon Ham Other cured meat Uncooked sausage Cooked ham Canned ham	<b>Fluid milks</b>  Fluid whole milk Fluid low-fat milk Fluid skim milk	<b>Bakery products</b>  Bread Unsweetened rolls Crackers Cookies Doughnuts Yeast-raised goods Desserts, pies, cakes Other bakery products Frozen desserts
<b>Other meat</b>  Veal Lamb and mutton Liver Other offal Other meat Bologna Other sausage Ready-cooked meat Other meat preparations Other canned meat	<b>Other dairy products</b>  Cream Yogurt Cheddar cheese Grated cheese Processed cheese Cottage cheese Other cheese Skim milk powder Condensed or evaporated milk Ice cream, ice milk Ice cream, novelties Other dairy products	<b>Cereal products</b>  Dry or fresh pasta Rice Flour Other grain products Breakfast cereal Cake and other mixes  <b>Fresh fruit</b>  Apples Bananas Grapefruit Grapes Lemons, limes Melons Oranges Peaches Pears

Table 2 (continued)

Plums	Other root vegetables	Carbonated beverages
Other tropical fruit	Other leaf vegetables	Fruit drinks
Strawberries		Other non-alcoholic beverages
Other fresh fruit		
<b>Processed fruit</b>	<b>Processed vegetables</b>	<b>Coffee and tea</b>
Raisins	Corn, frozen	Roasted coffee
Other dried fruit	Peas, frozen	Other coffee
Apple juice	Potatoes, frozen	Tea
Grapefruit juice	Other, frozen	
Orange juice	Green beans, frozen	
Other fruit juice	Corn, canned	
Conc. orange juice	Mushrooms, canned	
Conc. other juice	Peas, canned	
Peaches, canned	Tomatoes, canned	
Pineapple, canned	Other, canned	
Mixed fruit, canned	Vegetable juice, canned	
Other, canned		
Fruit pie fillings		
Frozen fruit		
Fruit-flavour crystals		
<b>Fresh vegetables</b>	<b>Miscellaneous foods</b>	<b>Fats and oils</b>
Beans	Pickles	Butter
Broccoli	Ketchup	Margarine
Cabbage	Other sauces	Shortening
Carrots	Other condiments	Lard
Cauliflower	Spices	Salad or cooking oil
Celery	Food preparation materials	Dairy substitutes
Corn	Flavourings	Mayonnaise
Cucumbers	Seasonings	
Lettuce		
Mushrooms		
Onions		
Peppers		
Potatoes		
Radishes		
Spinach		
Tomatoes		
Turnip or rutabagas		
Other seed vegetables		
	<b>Sugars</b>	<b>Prepared foods</b>
	Jams, jellies, marmalades	Canned pasta
	Refined sugar	Pasta mixes
	Molasses, syrups	Other cereals
	Gum	Meat stews
	Chocolate bars	Canned soup
	Other chocolate	Dried soup
	Sugar, candy	Canned baby food
	Other sugar confections	Baby food, cereal
	Other sugar preparations	Baby food, formula
	Honey	Pre-cooked frozen dinners
	Jelly powders	Frozen meat pies
	Other food preparations	Other pre-cooked food
		Snack foods

Source: Statistics Canada, *Family Food Expenditures in Canada, 1986* (Ottawa: Minister of Supply and Services Canada, 1989).

# Appendix A

## Report of the Scientific Review Committee: Executive Summary

**T**he Nutrition Recommendations for Canadians are a product of a review of the literature on nutrient requirements and on the various relationships linking nutrition and disease. They are intended to provide guidance in the selection of a dietary pattern that will supply recommended amounts of all essential nutrients while reducing the risk of chronic diseases. Although the recommendations are presented as individual entities, it is stressed that they will be fully effective only when applied as a unit. It is also important to appreciate that the recommendations are not a prescription and they can be satisfied by many combinations of available foods without any general need of supplements.

### Desired Characteristics of the Canadian Diet

The Canadian diet should provide energy consistent with the maintenance of body weight within the recommended range. Physical activity should be appropriate to circumstances and capabilities. Both longevity and the incidence of a number of chronic diseases are associated adversely with body weights above or below the recommended range. There is, thus, a health benefit to controlling weight, but a possible downside to control by energy intake alone; physical activity should also play a role. While the importance of maintaining some activity throughout life can be stressed, it is not possible to specify a level of physical activity appropriate for the whole population. As a general guideline it is desirable that adults, for as long as possible, maintain an activity level that permits an energy intake of at least 1800 kcal or 7.6 MJ/day while keeping weight within the recommended range.

The Canadian diet should include essential nutrients in amounts recommended in the SRC report. One of the reasons for including physical activity as a desirable element in weight control is the increasing difficulty in meeting the recommended nutrient intake (RNI) as energy intake falls below about 1800 kcal or 7.6 MJ/day. While it is important that the diet provide the recommended amounts of nutrients, it should be understood that no evidence was found that intakes in excess of the RNIs confer any health benefit. There is no general need for supplements except for vitamin D for infants and folic acid during pregnancy. Vitamin D supplementation might be required for elderly persons not exposed to the sun, and iron for pregnant women with low iron stores. It should be noted that while the habitual intake of certain nutrients, eg. protein and vitamin C, greatly exceeds the RNI, there is no reason to suggest that present intakes be reduced.

The Canadian diet should include no more than 30% of energy as fat (33 g/1000 kcal or 39 g/5000 kJ) and no more than 10% as saturated fat (11 g/1000 kcal or 13 g/5000 kJ). Diets high in fat have been associated with a high incidence of heart disease and certain types of cancer and a reduction in total fat intake is an important way to reduce the intake of saturated fat. The evidence linking saturated fat intake with elevated blood cholesterol and the risk of heart disease is among the most persuasive of all diet/disease relationships and was an important factor in establishing the recommended dietary pattern. Dietary cholesterol, though not as influential in affecting levels of blood cholesterol, is not without importance. A reduction in cholesterol intake normally will accompany a reduction in total fat

and saturated fat. The recommendation to reduce total fat intake does not apply to children under the age of two years.

**The Canadian diet should provide 55% of energy as carbohydrate (138 g/1000 kcal or 165 g/5000 kJ) from a variety of sources.**

Sources should be selected that provide complex carbohydrates, a variety of dietary fibre and  $\beta$ -carotene.

Carbohydrate is the preferred replacement for fat as a source of energy since protein intake already exceeds requirements. There are a number of reasons why the increased carbohydrate calories should be in the form of complex carbohydrates. Diets high in complex carbohydrates have been associated with a lower incidence of heart disease and cancer, and are sources of dietary fibre and of  $\beta$ -carotene.

**The sodium content of the Canadian diet should be reduced.** The present food supply provides sodium in an amount greatly exceeding requirements. While there is insufficient evidence to support a quantitative recommendation, potential benefit would be expected from a reduction in current sodium intake. Consumers are encouraged to reduce the use of salt (sodium chloride) in cooking and at the table, but individual efforts will be relatively ineffective unless the food industry makes a determined effort to reduce the sodium content of processed and prepared food. A diet rich in fruits and vegetables will ensure an adequate intake of potassium.

**The Canadian diet should include no more than 5% of total energy as alcohol, or two drinks daily, whichever is less.** There are many reasons to limit the use of alcohol. From the nutritional point of view alcohol dilutes the nutrient density of the diet and can undermine the consumption of RNIs. The deleterious influence of alcohol on blood pressure provides a more urgent reason for moderation. During pregnancy it is prudent to abstain from alcoholic beverages because a safe intake is not known with certainty.

**The Canadian diet should contain no more caffeine than the equivalent of four regular cups of coffee per day.** This is a prudent measure in view of the increased risk for cardiovascular disease associated with high intakes of caffeine.

**Community water supplies containing less than 1 mg/litre should be fluoridated to that level.** Fluoridation of community water supplies has proven to be a safe, effective and economical method of improving dental health.



# Appendix B

## Report of the Communications / Implementation Committee:

### Executive Summary

Optimal health for Canadians can only be achieved when greater efforts are made in health promotion and prevention of illness and when nutrition is an integral part of these efforts. A healthier population opts for a diet that promotes good health and that lowers the risk of chronic disease. While some controversy still exists about what constitutes a healthful diet, the nutritionally optimum diet is a concept that is more understood. The Scientific Review Committee (SRC) has provided an updated interpretation of the scientific evidence that defines a healthful diet for Canadians in the form of updated nutrition recommendations, including recommended nutrient intakes for Canadians. The SRC Nutrition Recommendations are intended to help Canadians select a dietary pattern that will supply recommended amounts of all essential nutrients while reducing the risk of chronic disease.

The Communications/Implementation Committee identified many gaps between estimated current consumption patterns and those recommended by the Scientific Review Committee. These gaps indicate nutrition problems for many Canadians whose dietary practices place them at greater risk of diet-related chronic diseases, such as heart disease and some types of cancer. To close these gaps, and thereby lower the risk of such diseases, Canadians must make changes in their diet, including lowering total and saturated fat, increasing complex carbohydrates and fibre, and reducing sodium, alcohol and caffeine. Water fluoridation programs are required in many communities.

The Nutrition Recommendations forwarded to the Communications/Implementation Committee (CIC) from the Scientific Review Committee were

translated to make them more accessible to the public. The translation is based on focus-group research at the consumer level and advice from nutrition educators. The Communications/Implementation Committee recommends the following translation for communication and implementation to professionals and the public:

#### Canada's Guidelines for Healthy Eating

- *Enjoy a VARIETY of foods.*
- *Emphasize cereals, breads, other grain products, vegetables and fruits.*
- *Choose low-fat dairy products, lean meats, and foods prepared with little or no fat.*
- *Achieve and maintain a healthy body weight by enjoying regular physical activity and healthy eating.*
- *Limit salt, alcohol and caffeine.*

The Guidelines are directed at healthy Canadians over two years of age. Collectively, these statements make up the key nutrition message for healthy Canadians. The CIC recommends that



further research be done to refine these messages for targeted sub-groups of the population such as low-literacy groups and ethnic groups.

The Committee also recommends revisions to *Canada's Food Guide* to reflect Canada's Guidelines for Healthy Eating. The revised guide should take a total diet approach which incorporates the wide range of foods that, although they are part of Canadian food patterns, are not recognized in the four food groups of the current guide.

The Communications/Implementation Committee recommends that many strategies be used for implementing Canada's Guidelines for Healthy Eating. There is a need to go beyond providing nutrition information to Canadians about what constitutes a healthy diet. Comprehensive and coordinated efforts must be made using a range of strategies. These strategies include:

- development of food and nutrition policies;
- collaboration and coordination among many partners;
- development of multisectoral, community-based nutrition intervention programs;
- creation of supportive environments in locations such as schools, worksites, restaurants and supermarkets, and through legislation and policy changes where appropriate; and
- increased efforts in nutrition research and surveillance.

The communication and implementation of Canada's Guidelines for Healthy Eating depends on commitments and partnerships at many levels, including governments, food and related industries, nutrition and other health professionals, non-governmental and community health organizations and the public. Responsibility for and commitment to the Guidelines and the Recommendations, as well as their communication and implementation, rests with all of these groups.

The Recommendations for Action are based on extensive Committee deliberations and large-scale consultations with representatives of the groups

to whom the Recommendations are directed. Successful implementation of the Recommendations for Action depends on sustained partnerships and long-term commitment from the Department of National Health and Welfare to facilitate coordinated implementation.

The Recommendations of the Communications/Implementation Committee are aimed at the following sectors: the Department of National Health and Welfare and other federal government departments; provincial, territorial and municipal governments; nutrition and other health professionals and their organizations; the food industry; the food services sector; non-governmental organizations; and the public.

The Committee developed core recommendations that are directed at all of these sectors, as well as specific recommendations for each.

### A. Core Recommendations for Action to all sectors

- A1 Initiate coordinated national food and nutrition policy, linking nutrition and health with agriculture, education, fitness, fisheries, social services, environment and other relevant sectors.
- A2 Adopt and promote Canada's Guidelines for Healthy Eating as the single set of nutrition recommendations for communication to and implementation by the healthy public over two years of age.
- A3 Integrate Canada's Guidelines for Healthy Eating into nutrition programs and materials.
- A4 Develop and ensure continued availability of targeted nutrition programs and materials to meet the needs of the population, taking into account sociodemographic and cultural characteristics.

A5 Initiate intersectoral initiatives to develop community-based nutrition programs to promote and support implementation of Canada's Guidelines for Healthy Eating, which include school, workplace, mass-media and point-of-purchase intervention programs.

A6 Initiate intersectoral cooperation to develop guidelines on the dissemination of health information associated with the sale of food products.

A7 Increase research efforts and support a national nutrition surveillance and monitoring system.

A8 Review the Nutrition Recommendations and Communications/ Implementation Strategies every five years.

## **B. Recommendations for Action to the Department of National Health and Welfare**

B1 Provide leadership for coordinating national implementation of the recommendations for action contained in the Report of the Communications/ Implementation Committee.

B2 Establish a Coordinating Group for Intersectoral Implementation of Canada's Guidelines for Healthy Eating that reports to the Minister of National Health and Welfare. Group members should include representatives from nutrition and other health professional organizations, food and related industries, non-governmental organizations, other government departments and the public.

B3 Review, in collaboration with these partners, the Nutrition Recommendations and the Communications/Implementation Strategies every five years.

B4 Adopt and promote Canada's Guidelines for Healthy Eating as the single set of nutrition recommendations for communication to the healthy public over two years of age.

B5 Advocate for and coordinate efforts in federal, provincial, territorial, and municipal governments to develop coordinated food and nutrition policy linking nutrition and health with agriculture, education, fisheries, fitness, social services, environment and other relevant sectors.

B6 Strengthen communication and cooperation on nutrition and health policy, program development and implementation within the Department of National Health and Welfare.

B7 Strengthen communication and coordination on issues of nutrition and food among the departments of National Health and Welfare, Agriculture, Consumer and Corporate Affairs, Fisheries and Oceans, and National Defence.

B8 Assess and revise, where necessary, public policy in areas such as free trade, sales tax reform, pesticide review, food commodity pricing and land use in order to support implementation of Canada's Guidelines for Healthy Eating.

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| B9  | Participate in intersectoral initiatives to develop guidelines on the dissemination of health information associated with the sale of food products and initiate needed legislative or policy revisions in support of these guidelines.                       | B16 | Revise <i>Canada's Food Guide</i> , incorporating the recommendations of the Task Group and the Technical Group on <i>Canada's Food Guide</i> . The revised food guide should be based on a total diet approach which incorporates Canada's Guidelines for Healthy Eating and reflects the Nutrition Recommendations. |
| B10 | Advocate for appropriate changes to the <i>Canadian Agricultural Products Act</i> to allow for development of low-fat, standardized dairy and meat products.  | B17 | Provide financial resources and collaborate with partner sectors to generate baseline and ongoing national data on the nutritional status and food consumption of Canadians.  |
| B11 | Advocate changes to dairy-product legislation to make available lowered-fat and altered-fat products in all provinces.  | B18 | Encourage evaluation of nutrition and health promotion programs through funding.  |
| B12 | Advocate to Agriculture Canada and provincial counterparts for nutrition as a primary determinant in agricultural food-product development.   | B19 | Monitor the effectiveness of the nutrition labelling program in assisting the public to act on Canada's Guidelines for Healthy Eating. Revise if needed.  |
| B13 | Advocate to the food industry for nutrition as a primary determinant in food-product development.   | B20 | Develop a protocol that can be used by different sectors for regular monitoring of awareness of, and compliance with, Canada's Guidelines for Healthy Eating.   |
| B14 | Support community-based nutrition initiatives by allocating substantial financial resources for large-scale demonstration projects in community nutrition; small-scale innovations; and the transfer of effective programs to other communities and agencies. | B21 | Actively disseminate and publicize widely research results and implications as they relate to the implementation of Canada's Guidelines for Healthy Eating.   |
| B15 | Develop, in consultation with the provinces and territories, enabling systems supportive of community action on nutrition — including incentive grants, training, consultative services and communications mechanisms.  | B22 | Provide funding, through the National Health Research and Development Program, for nutrition research in support of the implementation of Canada's Guidelines for Healthy Eating.   |

### C. Recommendations for Action to provincial, territorial and municipal governments

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| <p>C1 Provide leadership for coordinating provincial, territorial and municipal implementation of the recommendations for action contained in the Report of the Communications/Implementation Committee.</p> <p>C2 Establish a Coordinating Group for Intersectoral Implementation of Canada's Guidelines for Healthy Eating. Group members should include representatives from nutrition and health professional organizations, food and related industries, non-governmental organizations, other government departments and the public.</p> <p>C3 Adopt and promote Canada's Guidelines for Healthy Eating as the single set of nutrition recommendations for communication to the healthy public over two years of age.</p> <p>C4 Develop coordinated food and nutrition policy linking nutrition and health with agriculture, education, fisheries, fitness, social services, environment and other relevant sectors.</p> <p>C5 Incorporate Canada's Guidelines for Healthy Eating into programs, policies, legislation, media campaigns, etc. as appropriate, taking into account the needs of the local population.</p> <p>C6 Review staffing levels in community health services to achieve a minimum ratio of one public health nutritionist per 50 000 population.</p> | <p>C7 Develop plans, programs and policies to implement Canada's Guidelines for Healthy Eating, taking into account the sociodemographic and cultural needs of the population.</p> <p>C8 Provide funding and cooperate with the Department of National Health and Welfare to generate baseline and ongoing data on the nutritional status and food consumption of Canadians.</p> <p>C9 Support evaluation of nutrition and health promotion programs through funding.</p> <p>C10 Encourage the development of strategic grants to fund research in support of implementation of Canada's Guidelines for Healthy Eating.</p> <p>C11 Fully integrate nutrition into curricula at all levels in the formal education system, including teacher education programs.</p> <p>C12 Ensure that foods served in Canadian schools are consistent with Canada's Guidelines for Healthy Eating.</p> <p>C13 Initiate coordinated, comprehensive food and nutrition policies in schools.</p> <p>C14 Ensure municipal water contains fluoride at levels no less than 1 mg per litre.</p> <p>C15 Examine social assistance allowances, and adjust where necessary, to ensure that recipients can achieve Canada's Guidelines for Healthy Eating.</p> <p>C16 Change dairy product legislation, where restricted by law, to make available lowered-fat and altered-fat food products.</p> |
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C17	Make nutrition a primary determinant in agricultural food-product development.	D7	Participate in intersectoral initiatives to develop guidelines on the dissemination of health information associated with the sale of food products.
C18	Promote provincial food products based on their nutritional benefits.	D8	Advocate for and support efforts to develop provincial, territorial and local nutrition policies in schools.
D.	<b>Recommendations for Action to nutrition and other health professional organizations</b>	D9	Advocate for nutrition as a primary determinant in institutional and commercial food service.
D1	Adopt and promote Canada's Guidelines for Healthy Eating as the single set of nutrition recommendations for communication to the healthy public over two years of age.	D10	Advocate to Agriculture Canada and provincial counterparts for nutrition as a primary determinant in agricultural food-product development.
D2	Promote Canada's Guidelines for Healthy Eating and their implementation to members (through journals, newsletters, continuing education, annual meetings, etc.).	D11	Advocate to the food industry for nutrition as a primary determinant in food-product development.
D3	Stimulate discussion by and active participation of members at the national, provincial and community level to implement Canada's Guidelines for Healthy Eating.	D12	Generate data on awareness of and compliance with Canada's Guidelines for Healthy Eating, where health survey and research opportunities exist.
D4	Coordinate efforts with other partners to ensure the communication of a consistent message about diet and health.	D13	Advocate to the public and private sectors to undertake research in support of the implementation of Canada's Guidelines for Healthy Eating.
D5	Work with the public and private sectors and voluntary health agencies to develop and support nutrition policy at the national, provincial, territorial and community levels.	E.	<b>Recommendations for Action to nutrition and other health professionals</b>
D6	Place greater emphasis on nutrition in health promotion and disease prevention in education and continuing professional education programs for nutritionists and other health professionals.	E1	Encourage the implementation of Canada's Guidelines for Healthy Eating through advocacy for local policies (for example, municipal, worksite and school board policies).
		E2	Implement Canada's Guidelines for Healthy Eating in the agencies and settings in which they are employed in an effort to provide healthy clients with a consistent nutrition message.

E3 | Involve community leaders, the private sector and potential clients in integrating Canada's Guidelines for Healthy Eating into local programs (for example, programs for low-literacy groups and ethnic subgroups).

E4 | Initiate partnerships (for example, with community or church groups, and with worksite representatives) in the design, implementation and evaluation of community-based nutrition intervention programs.

E5 | Advocate for the integration of a nutrition component into all relevant community health programs.

#### **E. Recommendations for Action to the food industry**

F1 | Develop and incorporate company nutrition policies that encourage the production and promotion of food products and menu plans consistent with Canada's Guidelines for Healthy Eating.

F2 | Develop products low in total fat and energy and high in micronutrients. This would have greatest impact in dairy and bakery products and snack foods categories.

F3 | Reduce the use of salt and sodium-based ingredients in food processing.

F4 | Moderate the incorporation of trans-fatty acids into food products.

F5 | Conduct promotional campaigns consistent with Canada's Guidelines for Healthy Eating.

F6 | Support the efforts of health or nutrition organizations that are communicating Canada's Guidelines for Healthy Eating.

F7 | Expand active partnerships in nutrition education and promotion activities with health professionals and non-governmental health organizations.

F8 | Expand the use of voluntary nutrition labelling to as many products as possible.

F9 | Promote products on their nutritional benefits, using Canada's Guidelines for Healthy Eating to encourage customers to read nutrition labels.

F10 | Use labels and advertising to recommend smaller portions of high-fat foods.

F11 | Use low-fat ingredients in label or promotional recipes, menu plans and serving suggestions.

F12 | Participate in intersectoral initiatives to develop guidelines on the dissemination of health information associated with the sale of food products.

F13 | Conduct research and development activities to help create products that are low in total fat, saturated fat and cholesterol, and high in complex carbohydrates and fibre.

F14 | Participate in nutrition monitoring research with other sectors.

#### **G. Recommendations for Action to the food services sector**

G1 | Develop a nutrition policy that establishes nutrition as a primary determinant in food purchasing and product development.



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| <p>G2 Provide food choices for consumers that are low in total fat, saturated fat and cholesterol and high in complex carbohydrates and fibre in restaurants, cafeterias and vending machines.</p> <p>G3 Use non- or low-fat cooking methods in food preparation wherever possible.</p> <p>G4 Limit the use of salt in food preparation.</p> <p>G5 Emphasize menu items that are high in complex carbohydrates and low in total fat.</p> <p>G6 Provide nutrition education to chefs, cooks, wait staff and other food services personnel to assist them in the implementation of Canada's Guidelines for Healthy Eating.</p> <p>G7 Integrate nutrition education into formal training programs for food service managers, chefs, cooks, etc.</p> <p>G8 Provide nutrition information to consumers about the nutritional value of foods served.</p> <p>G9 Use menus and promotional materials to encourage food selection consistent with Canada's Guidelines for Healthy Eating.</p> <p>G10 Initiate partnerships (for example, with school, worksite and hospital representatives, and with nutrition and other health professionals) in the design, implementation and evaluation of community-based nutrition intervention programs.</p> <p>G11 Participate in intersectoral initiatives to develop guidelines on the dissemination of health information associated with the sale of food products.</p> | <p><b>H. Recommendations for Action to non-governmental organizations (such as the National Institute of Nutrition, PARTICIPaction, the Canadian Cancer Society, and the Heart and Stroke Foundation of Canada)</b></p> <p>H1 Adopt and promote Canada's Guidelines for Healthy Eating as the single set of nutrition recommendations for communication to the healthy public over two years of age.</p> <p>H2 Mobilize members and volunteers to promote Canada's Guidelines for Healthy Eating.</p> <p>H3 Ensure adequate professional support for nutrition programs.</p> <p>H4 Initiate partnerships (for example, with school, worksite, hospital and private sector representatives and with nutrition and other health professionals) in the design, implementation and evaluation of community-based nutrition intervention programs.</p> <p>H5 Work with the public and private sectors and health professional organizations to develop and support nutrition policy at the national, provincial, territorial and community levels.</p> <p>H6 Participate in intersectoral initiatives to develop guidelines on the dissemination of health information associated with the sale of food products.</p> <p>H7 Support evaluation of nutrition and health promotion programs through funding.</p> <p>H8 Support research on the relationship between diet and chronic diseases.</p> |
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- H9 Advocate to Agriculture Canada and provincial counterparts for nutrition as a primary determinant in agricultural food-product development.
- H10 Advocate to the food industry for nutrition as a primary determinant in food-product development.

#### **I. Recommendations for Action to the public**

- I1 Adopt Canada's Guidelines for Healthy Eating for those over two years of age.
- I2 Influence family, friends and co-workers to adopt Canada's Guidelines for Healthy Eating, and support them in their efforts to do so.
- I3 Advocate for financially, geographically and culturally accessible food choices consistent with Canada's Guidelines for Healthy Eating in locations such as supermarkets, schools, workplaces and restaurants.
- I4 Advocate for food and nutrition policies in the community and at a national level that support Canada's Guidelines for Healthy Eating.
- I5 Advocate for availability of and accessibility to nutrition programs in the community.

If the Guidelines are to be implemented successfully, each of these sectors must accept to act on the Recommendations for Action. Ultimately, the Canadian population will consume a more healthful diet and, as a result, enjoy a healthier life.







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